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THE PERCEPTION OF INDONESIAN HIGHER EDUCATION STUDENTS TOWARD ONLINE LEARNING DURING COVID-19 PANDEMIC

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ABSTRACT

In the 21st century, the teaching and learning process can be done digitally through online learning. During the COVID-19 pandemic, online learning became mandatory in Indonesia, especially in higher education. This article aimed at analyzing Indonesia's higher students' perceptions towards online learning amid the COVID-19 pandemic. The data in this article were collected and analyzed through the library research model proposed by George. The data sources were collected from various journals by considering six criteria. Thirty-two articles related to students' perception of online learning during the COVID-19 pandemic were collected and analyzed by reading, understanding, and grouping the students' perceptions. The results found four positive perceptions towards online learning: flexibility, availability of learning material, motivation, and variations of online platforms. The significant advantage which was felt by the higher education students towards online learning was its flexibility. Online learning made the students able to learn at any time and anywhere. The negative perceptions towards online learning were related to internet access, unstable internet connection, lack of interaction, ineffective instruction, and health issues. The significant disadvantages caused by online learning were internet connection and signal strength. An unstable internet connection and signal strength made the students feel uncomfortable while learning through online learning.

Keywords: COVID-19, Indonesian higher education students, online learning, perception

INTRODUCTION

The COVID-19 pandemic led the teaching and learning process to shift into online learning. First detected in Indonesia around March 2020, COVID-19 affected all aspects of life (Adnan & Anwar, 2020; Lebni et al., 2024; Nandal et al., 2024; Naveed et al., 2024; Singh et al., 2024). Education changed from conventional classroom activities to online learning (Adedoyin & Soykan, 2023; Aristovnik et al., 2023; Khong et al., 2023; Osman et al., 2023; Tang, 2023). The outbreak significantly impacted Indonesia's education system, with 646 schools from kindergarten to university closed, 68.8 million students learning from home, and 4.2 million teachers teaching from home (Liputan6, 2020). The Ministry of Education and Culture then mandated all teaching and learning to be conducted from home, launching the Belajar Dari Rumah (BDR) policy through Circular Letter Number 4 of 2020 regarding education during the COVID-19 emergency.

Online learning becomes a common teaching and learning process during the COVID-19 pandemic, in which the activities are done by assisting technology without including direct face-to-face meetings. The spread of online learning in Indonesia happens not only in cities but also in small villages (Agung et al., 2020). Online learning can be described as a learning environment that includes the role of technology in the activity, and it offers freedom of time and space (Baber, 2020; Suwastini et al., 2023). Besides, online learning can be specified as a language learning environment assisted by computers, smartphones, the internet, and other web technologies (Erarslan & Arslan, 2020; Ibrahim & Al-Jadaan, 2024). To conduct online learning, all participants, teachers, and students should have an internet connection since it is their main requirement (Agung et al., 2020). Another tool utilized for online learning is learning platforms (Fitriani et al., 2020; Guerrero-Quinonez et al., 2023). Some online platforms are used in online learning, namely Zoom, Google classroom, Google meet, even social media

such as WhatsApp (Badaruddin et al., 2023; Berutu & Hanana, 2023; Nasution & Ahmad, 2020).

Online learning offers some advantages for the participants. The major advantage that the participants feel is the flexibility of online learning. Online learning offers significant flexibility, such as time and places flexibility (Nkwanyana & Fagbadebo, 2024). Online learning offers place flexibility because online learning can be done at home (Priyono et al., 2020), and it can be accessed anywhere (Mulyani et al., 2021; Ningsih, 2020). Online learning makes both the teachers and students can do their teaching and learning process at home, so it makes the students and the teacher do not need to have extra transportation costs to go to a specific place. Online learning offers both teachers and students flexibility because the teacher and students can be connected at any place and at any time (Nambiar, 2020). Flexibility in time and place are two general advantages that both teachers and students feel. Besides the flexibility, online learning also gives other advantages.

Implementing online learning amid the COVID-19 pandemic becomes one great solution to keep the teacher and students connected. A study Allo (2020) and Nkwanyana and Fagbadebo (2024) found that online learning was beneficial for the students in the middle of the COVID-19 pandemic. In Pakistan (Adnan & Anwar, 2020), the students showed that online learning made the students motivated to learn rather than conventional learning. Motivation can affect the process of learning, and conventional teaching can make the students feel unmotivated to learn (Lesmana & Lubis, 2020). The students' motivation is also caused by the freedom to use any suitable learning styles during online learning. The students can determine and use their learning styles based on their ways of learning. Learning styles is one factor that can affect the students' achievement in learning (Chan & Rahman, 2019). Besides, an individual task in online learning during the COVID-19 pandemic was beneficial to decrease the number of cases of COVID-19 since it let the students keep the distance between one student with other students. Furthermore, the students also stated that group task during online learning was beneficial for the students who did not have the appropriate tool and equipment for following the online learning.

Several studies have examined the success of online learning during the COVID-19 pandemic, which can be reflected through students' positive perceptions. Adnan & Anwar (2020) studied higher education students in Pakistan, focusing on the effectiveness of online learning and its challenges. Their findings showed that students felt comfortable with digital communication and were motivated. Similarly, Biswas et al. (2020) investigated university students in Bangladesh and found that online learning was a good option to reduce study gaps, improve study skills and knowledge, provide new learning experiences, and enhance motivation. Besides, a study on IT students in Sri Lanka found that online learning during the COVID-19 pandemic made the students participate actively (Akuratiya & Meddage, 2020). Junior high school students at Maria Bintang Laut acknowledged that they wanted to have online learning in the future (Fahik & Santosa, 2021). From those studies, it can be seen that the implementation of online learning in the middle of the COVID-19 pandemic offers positive impacts for the students.

However, negative perceptions towards online learning in the middle of the COVID-19 pandemic are undeniable. Teachers and students face difficulties during online learning, and it leads to negative perceptions toward online learning. Teachers found ICT difficulties, internet connection problems, time management, and their students' accessibility during the implementation of online learning in the COVID-19 pandemic thus the teacher preferred face to face interaction (Puspitasari et al., 2021). Some studies found that students revealed negative perceptions towards online learning during the COVID-19 pandemic. High school students in East Java Province, Indonesia revealed that the students faced limited internet quota and signal issues during online learning during the COVID-19 pandemic (Meisandy & Sumarmi, 2020).

A study that was conducted in Pakistan Adnan and Anwar (2020) found that students face difficulties related to group work. Even though the group projects could be done digitally, but they stated that it was difficult to finish group projects through distance education or online learning. The teacher in Bangalore city argued that online learning made them difficult to control their students' group interaction (Nambiar, 2020). University students in Bangladesh argued that online learning made them spend extra charge on the internet since it was the primary requirement of online learning (Biswas et al., 2020). Study conducted in Nepal assessed bachelor of dental surgery students' perceptions of online learning in the middle of the COVID-19 pandemic (Gupta et al., 2022). The studies established that the students felt online learning was distracting. Studies that were conducted towards Indonesia's higher education students also found a negative perception of online learning during the COVID-19 pandemic. There were five negative perceptions collected from Indonesia's higher education students from various studies namely internet access (Purwasih et al., 2020), (Agung et al., 2020), (Nasution & Ahmad, 2020), (Ningsih, 2020), (Mulyani et al., 2021), (Towip et al., 2021), (Hamid et al., 2020), (Basri et al., 2020), (Rinekso & Muslim, 2020), (Rifiyanti, 2020), (Tanjung & Utomo, 2021), and (Famularsih, 2020), unstable internet connection (Ariyanti, 2020), (Purwasih et al., 2020), (Agung et al., 2020), (Nasution & Ahmad, 2020), (Ningsih, 2020), (Sujarwo et al., 2020), (Ningsih, 2020), (Ariyanti, 2020), (Susila et al., 2020), (Yulandari, 2020), (Nugroho, 2020), and (Nartiningrum & Nugroho, 2020), (Maulana & Hamidi, 2020), (Febrianto et al., 2020), and (Azhar, 2020), lack of interaction (Purwasih et al., 2020), (Fitriani et al., 2020), (Rojabi, 2020), (Daroedono et al., 2020), (Nugroho, 2020), (Nartiningrum & Nugroho, 2020), (Rasto et al., 2021), (Febrianto et al., 2020), and (Famularsih, 2020), ineffective instruction (Ariyanti, 2020), (Sadikin & Hamidah, 2020), (Purwasih et al., 2020), (Rojabi, 2020), (Susila et al., 2020), (Ningsih, 2020), (Fitriani et al., 2020), (Hamid et al., 2020), (Daroedono et al., 2020), (Yulandari, 2020), (Nugroho, 2020), (Anim & Mapilindo, 2020), (Maulana & Hamidi, 2020), and (Syauqi et al., 2020), and health issues (Ariyanti, 2020) and (Tanjung & Utomo, 2021). The higher education students' negative perceptions show that even though online learning offers some advantages (Adnan & Anwar, 2020) (Biswas et al., 2020) (Akuratiya & Meddage, 2020), the students still revealed negative perceptions toward online learning. Some problems cause negative perceptions towards online learning.

This article aimed to group Indonesian higher education students' positive and negative perceptions of online learning during the COVID-19 pandemic. It discussed both perceptions to comprehensively identify the causes and effects of online learning in that period. In the 21st century, technology plays a vital role in human life, including education, and it facilitated the teaching and learning process during the pandemic, allowing students to learn anytime and anywhere. The findings of this article can be used by education stakeholders to determine future regulations, while also guiding students, teachers, and researchers in addressing the factors behind negative perceptions. Consequently, alternative solutions can be developed to reduce negative views and enhance positive ones, making online learning more successful in the future.

METHOD

This article applied library research as its research method. Library research involved identifying various sources that provided factual information, expert opinion on research, and any necessary research component needed (George, 2008). The first step was choosing a general topic to be studied. The general topic was higher students' perceptions of online learning implementation during the COVID-19 pandemic. In the second step, brainstorming on the topic was conducted. The third step was highlighting the research question. Through this step, the article's research question was constructed: "What are the positive and negative

perceptions of the higher students in Indonesia toward online learning implementation in the COVID-19 pandemic?" The fourth step was developing research strategies, which determine the use of library research to answer the research question. It was followed by determining Google search as the reference tool to collect some references that required the sources' criteria.

The data sources were collected by identifying and deciding the criteria of the data sources initially. The data sources were collected by considering six criteria: the sources were indexed by minimum Sinta 1-6, year of publication 2020-2021, discussing online learning, discussing online learning implementation during the COVID-19 pandemic, the setting of the studies were in Indonesia, and the participants were higher education students in which it indicated the students in college. The seventh step was evaluating the sources based on the research questions, where irrelevant sources were excluded.

The collected data sources were analyzed through the eighth step in this research. The eighth step was, understanding the sources. Understanding the sources was done through analyzing the data sources by reading, understanding, and grouping the students' perceptions based on the positive and negative perceptions. The ninth step was designing a thesis statement, where the arguments of students' positive and negative perceptions were outlined in a comprehensive research report in the form of the present article. The was further revised according to suggestions from colleagues and reviewers.

RESULT AND DISCUSSION

The present study was aimed to map Indonesian higher education students' perceptions towards online learning in the COVID-19 pandemic in Indonesia. Thirty-two related studies across universities in Indonesia had been investigated, chosen for their relevance in identifying the factors affecting the students' perceptions of online learning.

Factors affecting students' positive perceptions towards online learning during the COVID-19 pandemic

Online learning implementation offered some benefits for the student's learning activity. According to the previous studies, the higher students in Indonesia revealed four positive perceptions of online learning. Those positive perceptions were affected by flexibility, availability of learning material, motivation, and variations of online platforms. Each of the positive perceptions was presented below.

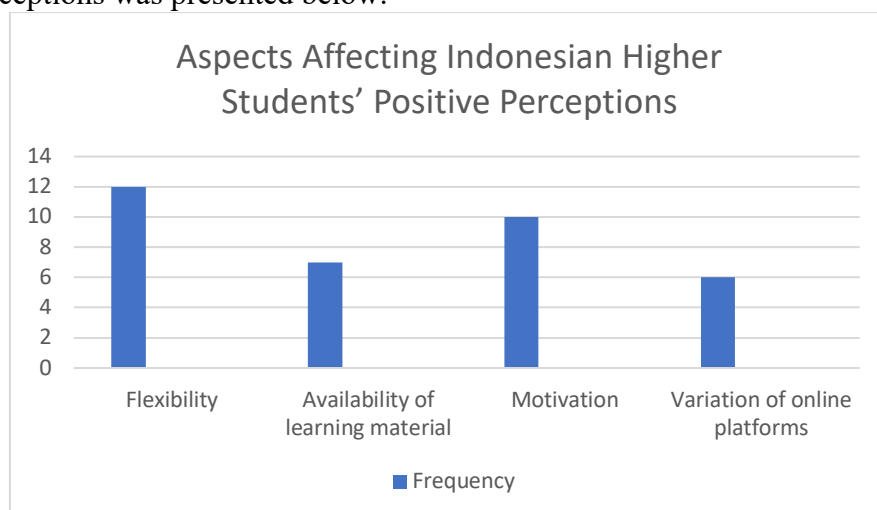


Figure 1. Factors affecting Indonesian Higher Education Students' positive perception toward online learning during COVID-19 pandemic

The figure above showed that four factors affected the students' positive perceptions of online learning. Those factors were flexibility, availability of learning material, motivation, and variations of online platforms. The explanation of each factor is described further below.

Flexibility

Online learning offered flexibility for the students. Since the learning activity was done through online learning, the students could access learning materials and follow online learning at any time and anywhere. Besides, the students could arrange their own time and use their learning styles to finish their assignments. There were some studies revealed that online learning offered flexibility for the students. The flexibilities offered by online learning were time flexibility, place flexibility, and learning styles flexibility.

Table 1. Flexibility during online learning in synchronous and asynchronous online learning

No.	Flexibility	Synchronous	Asynchronous
1	Time	√	√
2	Place	√	√
3	Learning styles	√	-

Table 1 presented that three flexibilities affected the Indonesian Higher Education students who followed synchronous online learning positive perceptions. Two flexibilities affected the Indonesian Higher Education students who followed asynchronous online learning positive perceptions. The flexibilities which the synchronous online learning students felt were time, place, and learning styles flexibilities. However, the students of asynchronous online learning revealed that the flexibility offered during the COVID-19 pandemic was time and place flexibility.

Synchronous online learning offered flexibility for the students in terms of time flexibility by learning at any time and location flexibility by learning at any place (Mulyani et al., 2021; Sudewi, 2021). This flexibility allowed students time efficiency (Ningsih, 2020). Students did not need to go to campus to study, and they could attend the class from home or places of their choice (Ariyanti, 2020). The students could access the material and learn them according to their learning styles (Ningsih, 2020; Sudewi, 2021). Students enjoyed the learning environment since it was a new thing for them to learn English through online learning, and they could learn it enjoyable at home (Rojabi, 2020). Besides, the application used in online learning could be accessed wherever (Sujarwo et al., 2020); thus, it made the students flexible in joining the online learning. Online learning's flexibility in time was effective and efficient (Towip et al., 2021). Time allocation to finish the assignments also allowed the students to manage their time, so it offered time flexibility for the students to finish the assignments (Firman, 2020). The implementation of online learning during the COVID-19 pandemic made the learning activities more effective and efficient because of the time and place flexibility (Febrianto et al., 2020).

Flexibility was also felt by the students who followed asynchronous online learning. Some studies revealed that asynchronous online learning offered flexibility for the students. Online learning offered flexibility for the students in terms of time flexibility by being able to learn at any time and location flexibility by being able to learn at any place (Daroedono et al., 2020). Besides, the flexibility of online learning allowed the students to do other activities like listening to music, eating, or even watching television (Yulandari, 2020). The implementation of online learning offered effectiveness and time efficiency for the students (Basri et al., 2020).

Availability of Learning Material

Teaching and learning through online learning did not mean that there was no learning material needed. Learning materials helped the students understand the whole material. Learning materials which the lecturer provided should also be relevant to the syllabus or course plan. Thus, the students could achieve the learning objectives. The availability of learning material became a positive perception found by some studies related to the implementation of online learning during the COVID-19 pandemic.

Table 2. Availability of learning material in online learning during the COVID-19 pandemic

No	Availability of Material	Synchronous	Asynchronous
1	Related to syllabus	√	√
2	Related to semester plan	√	√
3	Relevant material	√	√

Students taught through synchronous online learning in the pandemic of COVID-19 stated that learning materials were still provided by their lecturer. The provided materials through conducting online learning were related to the syllabus and the course. Students comprehended the materials delivered by their lecturer through online learning easier since the materials were relevant to the course. The assignments also were related to the materials given before and related to the course (Agung et al., 2020). Most students who participated in the study revealed that they agreed that the delivered materials were suitable for the course syllabus (Nasution & Ahmad, 2020). The material delivered also related to the learning plan for the current semester, which the lecturer had distributed at the initial meeting of the online learning (Sudewi, 2021). The media, objectives, and resources for learning were appropriately managed by the instructor (Towip et al., 2021). The content or materials delivered by the lectures were in line with the following learning activity, so in the next activity, the students were able to complete the activity because it was related to the previous content (Rineksa & Muslim, 2020).

Online learning, which was done through asynchronous online learning, also provided related material. Even though the learning was done through online learning, the lecturer still taught the students relevant materials related to the semester learning plan (Maulana & Hamidi, 2020). Even though the teaching and learning activity was done through online learning, the teacher did not teach irrelevant material to the students. The teacher kept teaching the students based on the teaching plan and relevant material.

Motivation

Online learning was motivating. The students who had not followed online learning before the spread of the COVID-19 felt new experiences towards online learning. The experiences came from various teaching strategies offered by the teacher and various teaching and learning platforms. Online learning made the teacher was creative to design the learning activity. An engaging learning activity made the students motivated and enthusiastic about continuing their learning. Besides, various platforms for learning made the students excited to learn through some new online platforms.

Table 3. Motivation's effects during online learning in synchronous and asynchronous online learning

No	Motivation's effects	Synchronous	Asynchronous
1	Enthusiast	√	-
2	Continuity to learn	√	-
3	Active participation	√	√

Synchronous and asynchronous online learning students were motivated during the online learning in the middle of the COVID-19 pandemic. Three main effects were caused by online learning in the middle of the COVID-19 pandemic. Those effects were that students became enthusiastic, had a willingness to learn, and became active participants.

The implementation of synchronous online learning in the COVID-19 outbreak in Indonesia increased the students' motivation to learn. Students were motivated and enthusiastic while learning through online learning during the pandemic of COVID-19, especially in learning listening (Sudewi, 2021). The learning materials, which were varied and collaborated with fun learning activities, stimulated the students' enthusiasm to learn the material actively (Rojabi, 2020). The students were highly interested to learn through online learning (Susila et al., 2020). The availability of various applications used in online learning made the students interested and was motivated them to learn through online learning (Sujarwo et al., 2020). Besides, the platforms used during the online learning were attractive and challenging, and it affected the students' motivation to continue learning and study more (Mulyani et al., 2021). Students were familiar with some platforms used in online learning. It increased the students' learning motivation and changed their attitude in using social media into positive attitudes (Tanjung & Utomo, 2021). Learning motivation also made the students participate actively during the online learning discussion (Rasto et al., 2021; Rinekso & Muslim, 2020).

Online learning implementation also affected the students' motivation for those who followed asynchronous online learning. The implementation of online learning during the COVID-19 pandemic made the students participate more actively and creatively (Saleh et al., 2021).

Variations of Online Platforms

Besides, online learning could be done anytime, and anywhere could also be done by utilizing various online platforms. Technology supported online learning by providing various teaching and learning platforms. The platforms could facilitate online learning by utilizing video conferences and sharing learning materials and assignments. Students are familiar with various online platforms, such as Zoom meetings and social media for chatting like WhatsApp. There were various online platforms which were used by the students revealed from the studies found.

The table shows the various platform used for supporting online learning during the COVID-19 pandemic in Indonesia. The technology used to assist in successfully implementing synchronous online learning was varied, starting from the learning management system provided by the government or institution or even social media. Some technology implemented to support online learning were Google classroom, Edmodo, Moodle, WhatsApp, Facebook, Instagram, Zoom video conference, and Google meet (Susila et al., 2020). The students of the education technology program utilized various applications that could be used for learning, such as Google classroom, WhatsApp, Zoom video conference, Edmodo, e-mail, and YouTube (Ningsih, 2020). The implementation of online learning utilized technology such as WhatsApp,

Zoom video conference, Google classroom, YouTube, Telegram, Instagram, and other applications (Sujarwo et al., 2020). Various platforms were also utilized by the university students in Aceh who stated that their platforms varied, such as WhatsApp, Opensimka, Google classroom, Google meet, Zoom video conference, Edmodo, and YouTube (Mulyani et al., 2021). Besides, students also used Zoom video conference, Google Classroom, Google meet, and a learning platform from their institute named SIAKAD (Rifiyanti, 2020).

The positive perception of asynchronous online learning during the pandemic of COVID-19 in Indonesia also showed variations in online platforms. Students of the Mathematics Education program at Universitas Asahan used WhatsApp, Google Meet, Google classroom, Zoom video conference, and other technology to follow the online learning program (Anim & Mapilindo, 2020).

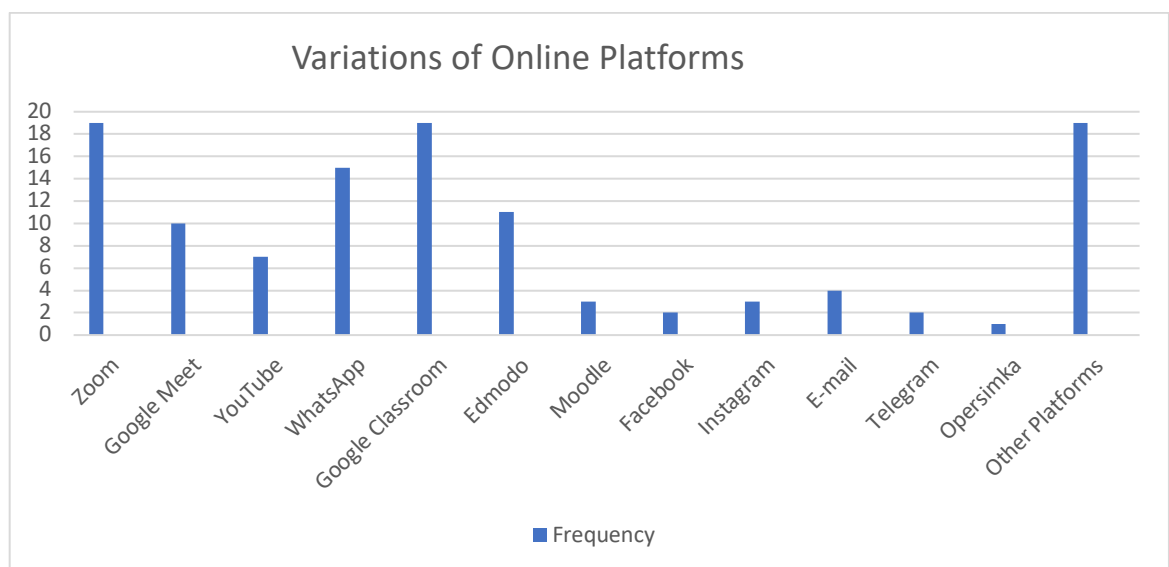


Figure 2. Variations of Online Learning Platforms

The data on online learning platforms shows that Zoom, Google Classroom, and other platforms were the most widely used, each with 19 users. WhatsApp also played a significant role with 15 users, followed by Edmodo (11) and Google Meet (10). Meanwhile, YouTube was used by 7 users, while Moodle and Instagram were each chosen by 3 users, and E-mail by 4 users. Less frequently used platforms included Facebook and Telegram with 2 users each, and Opensimka with only 1 user. This indicates that students tended to prefer platforms that were more familiar, accessible, and user-friendly for supporting online learning.

Students' negative perceptions towards online learning during the COVID-19 pandemic

The implementation of online learning made the students face some difficulties and revealed negative perceptions of online learning. The higher students revealed five negative perspectives toward online learning implementation in the COVID-19 pandemic. Those perspectives were internet access, unstable internet connection, lack of interaction, ineffective instruction, and health issues.

Table 4. Factors affecting Indonesian Higher Education Students' negative perception toward online learning during COVID-19 pandemic

No.	Aspects affecting Indonesian Higher Students' negative perceptions	References
1	Internet access	(Purwasih, Komala, & Santana, 2020), (Agung, Surtikanti, & Quinones, 2020), (Nasution & Ahmad, 2020), (Ningsih, 2020), (Mulyani, Fidyanti, Suryanti, Suri, & Halimatussakdiah, 2021), (Towip, Estriyanto, Rohman, Suharno, & Pambudi, 2021), (Hamid, SENTRYO, & Hasan, 2020), and (Basri, Husain, & Modayana, 2020), (Rinekso & Muslim, 2020), (Rifiyanti, 2020), (Tanjung & Utomo, 2021), (Famularsih, 2020), (Fahik & Santosa, 2021), (Meisandy & Sumarmi, 2020).
2	Unstable internet connection	(Ariyanti, 2020), (Purwasih, Komala, & Santana, 2020), (Agung, Surtikanti, & Quinones, 2020), (Nasution & Ahmad, 2020), (Ningsih, 2020), (Sujarwo, Sukmawati, Akhiruddin, Ridwan, & Siradjuddin, 2020), (Ningsih, 2020), (Ariyanti, 2020), (Susila, Qosim, & Rositasari, 2020), (Yulandari, 2020), (Nugroho, 2020), and (Nartiningrum & Nugroho, 2020), (Maulana & Hamidi, 2020), (Rasto, Muhidin, Inayati, & Marsofiyati, 2021), (Febrianto, Mas'udah, & Megasari, 2020), (Azhar, 2020)
3	Lack of interaction	(Purwasih, Komala, & Santana, 2020), (Fitriani, Bandung, & Kadri, 2020), (Rojabi, 2020), (Daroedono, et al., 2020), (Nugroho, 2020), and (Nartiningrum & Nugroho, 2020), (Rasto, Muhidin, Inayati, & Marsofiyati, 2021), (Febrianto, Mas'udah, & Megasari, 2020), (Famularsih, 2020)
4	Ineffective instruction	(Ariyanti, 2020), (Sadikin & Hamidah, 2020), (Purwasih, Komala, & Santana, 2020), (Rojabi, 2020), (Susila, Qosim, & Rositasari, 2020), (Ningsih, 2020), (Fitriani, Bandung, & Kadri, 2020), (Hamid, SENTRYO, & Hasan, 2020), (Daroedono, et al., 2020), (Yulandari, 2020), (Nugroho, 2020), (Anim & Mapilindo, 2020), and (Maulana & Hamidi, 2020), (Syauqi, Munadi, & Triyono, 2020), (Saleh, Sari, & Alim, 2021).
5	Health issue	(Ariyanti, 2020) and (Tanjung & Utomo, 2021)

Internet Access

Since online learning needed an internet connection to make the students stay connected, internet access also became a problem. Internet issues might be the significant difficulty proposed by the students in previous studies and faced by the students during the implementation of online learning. Unstable internet access made online learning did not run smoothly (Meisandy & Sumarmi, 2020). Besides, the unstable and unavailability of internet access made the students could not follow online learning well since they needed internet access to download learning materials, upload assignments, and join video conferences. The students who followed synchronous and asynchronous online learning felt the problem of internet access.

Table 5. Internet issues during online learning in the COVID-19 pandemic that affected Indonesian Higher Education Students negative perception

No	Internet issue	Synchronous	Asynchronous
1	Unavailability	√	-
2	Run of internet quota	√	-
3	Huge internet quota	√	-
4	Huge cost	√	-
5	Connectivity	√	-
6	Poor internet access	√	√

Table 5 showed that various internet issues affected the students' negative perceptions towards online learning in the middle of the COVID-19 pandemic. An internet connection issue was most felt by the students who were taught through synchronous online learning. It started to become a barrier for the students during online learning (Purwasih et al., 2020). Unstable or unavailable internet access made it challenging for the students to follow online learning and browse, upload, and download files. Most of the time, students ran out of internet quota, which may not be affordable for most students (Agung et al., 2020). Students felt burdened by the financial toll brought by the internet quota for supporting their online learning (Nasution & Ahmad, 2020; Ningsih, 2020). Students revealed that internet issues such as huge costs made the students did not want to continue online learning (Mulyani et al., 2021). Online learning made the students face difficulty in terms of internet data and connectivity (Towip et al., 2021). Network access and extra quota cost inhibited the students from following online learning (Hamid et al., 2020; Tanjung & Utomo, 2021). Furthermore, poor internet connection (Rinekso & Muslim, 2020; Tanjung & Utomo, 2021) and slow speed of the internet (Famularsih, 2020) also affect students' efficacy in delivering questions or answers during the synchronous online discussion (Rifiyanti, 2020).

The students who followed asynchronous online learning also felt that the problem they faced was internet access (Fahik & Santosa, 2021). The students felt that internet access was the main obstacle they faced during the implementation of asynchronous online learning (Basri et al., 2020). They added that poor internet access boosted the platforms that they used could not be implemented.

Unstable Internet Connection

Online learning implementation made the students face another issue related to the internet connection. Students faced an internet issue that was caused mainly by an unstable connection. An unstable signal interrupted the internet connection stability and affected the flow of online learning. The students faced various unstable internet connection problems, and those were presented in table 6 below.

Table 6. Unstable internet connection problem that affected the Indonesia Higher Education Students' negative perceptions

No	Unstable internet connection problem	Synchronous	Asynchronous
1	Different signal strength	√	-

2	Unstable signal strength	√	√
3	Signal loss	-	√

Table 6 showed that the students' unstable internet connection was caused by different signal strength, unstable signal strengths, and even signal loss. Unstable internet connection was felt both by the students who learned through synchronous and asynchronous online learning. It affected the students' negative perception toward online learning in the middle of the COVID-19.

An unstable internet connection became a problem during synchronous online learning. The different states of the students made different signal strengths between in town and their hometown, so most students decided to stay in town to get at least a stable signal (Ariyanti, 2020). The different states of the students also caused unstable signals, and not all the students lived in a place where the signal was stable (Purwasih et al., 2020). The students even needed to go to the highest place, such as a hill, or go away from their house to get stable signal strength (Agung et al., 2020). Signal strength or signal quality became one barrier for the students during the online learning implementation (Nasution & Ahmad, 2020; Ningsih, 2020) since the signal strength between the remote area and the city was different (Azhar, 2020; Febrianto et al., 2020; Rasto et al., 2021; Sujarwo et al., 2020) thus the internet could not be accessed easily. Limited signal availability made the students prefer face-to-face or conventional learning in the classroom rather than online learning (Ningsih, 2020). Unstable internet connection made the students face difficulties in joining online learning (Ariyanti, 2020). Besides, unstable internet connections with poor quality made the students not want to continue online learning (Susila et al., 2020). Some online platforms which the students used during online learning also required a large internet quota to be accessed (Febrianto et al., 2020).

Furthermore, similar difficulty was also felt by the students who were taught through asynchronous online learning. Inappropriate signal availability made the online learning was disturbed, and students could not understand and catch the material delivered to the maximum (Yulandari, 2020). Sometimes during online learning, the signal was lost and caused a problem in the learning activity (Nugroho, 2020). All of those studies also concluded that unstable signal strength affected their internet connection since the excellent internet connection was also decided by the signal's availability and strength. A general problem that the students faced during online learning were an unstable internet connection and expensive internet tolls (Maulana & Hamidi, 2020; Nartiningrum & Nugroho, 2020).

Lack of interaction

Online learning made the students feel less interaction when it was compared with face-to-face learning. Students learned materials through conventional face-to-face meetings in the classroom before the pandemic of the COVID-19 spread. They met their lecturer, friends, and everything was discussed directly. However, it changed into online learning, and the learning process was done digitally without having real face-to-face meetings. The implementation of online learning in the COVID-19 pandemic decreased the students-students and teacher-student interaction. Interaction lacking made the students unmotivated to learn sometimes. Interaction lacking caused the negative point of view of the students toward online learning. It was felt by the students who learned through synchronous and asynchronous online learning.

Table 7. Factors affected lack of interaction in online learning during the COVID-19 pandemic.

No	Factors of interaction lacking	Synchronous	Asynchronous
1	Unwell-interaction	√	-
2	No direct interaction	√	√
3	Low intensity of interaction	√	-
4	Limited interaction	-	√

Table 7 presented that four factors made the students reveal negative perceptions towards online learning during the pandemic of the COVID-19 in terms of interaction. Lack of interaction during online learning was caused by unwell-interaction, no direct interaction, low intensity of interaction, and limited interaction.

Students taught through synchronous online learning felt that the interaction during the teaching and learning process was lacking. During the implementation of online learning, it was also found that the lecturer did not well-interacted with the students (Purwasih et al., 2020). Hence, it caused a lack of interaction (Rasto et al., 2021). There was not much direct interaction between the students-students or students-lecturer during the online learning (Famularsih, 2020; Fitriani et al., 2020). The online class made the students could not interact with other students, and more difficult to get closer with the lecturer because of the low intensity of the interaction (Rojabi, 2020), and the less interaction made the students feel uncomfortable during online learning (Febrianto et al., 2020).

A similar negative perception was also found in asynchronous online learning. Online learning during the pandemic of COVID-19 made the teaching and learning process lack interaction. Students' perceptions of online learning in the middle of the COVID-19 pandemic from previous related studies showed similar negative perceptions. Students showed that the implementation of online learning during the COVID-19 pandemic lacked interaction between the students-students and teacher-students (Daroedono et al., 2020). Lack of direct interaction during online learning between the teacher and students caused boredom, and then the students were uninterested in the learning activity or material (Nugroho, 2020). Online learning made the interaction, communication, and social interactions that happened during online learning was limited between the lecturer-students and the students-students (Nartiningrum & Nugroho, 2020).

Ineffective Instruction

Online learning made the teaching and learning process run ineffectively. One of the causes was ineffective instruction from the lecturer. Sometimes, during online learning implementation, the lecturer did not explain before the students finished their assignments. Besides, the teaching strategy that the lecturer used was not attractive then it made the students unmotivated to learn. The lecturer was also sometimes absent during the online learning. Even though the teaching activity was switched to online learning, it did not mean that teacher or lecture could be absent during the learning process. The teacher still had a role in giving explicit instruction to the students. Unclear or ineffective instruction would lead to the students' lack of understanding. It was felt by the students who were taught through synchronous and asynchronous online learning.

Table 8. Factors of ineffective instruction affected the students' understanding during online learning and their negative perceptions towards online learning.

No	Factors	Synchronous	Asynchronous
1	Material	√	√
2	Learning media	√	-
3	Teacher's explanation	√	√
4	Limited interaction	√	-
5	Teaching strategy	√	√

Synchronous online learning students lacked understanding because of ineffective instruction, making online learning less effective (Saleh et al., 2021). The changes from face-to-face learning activities into online learning made the students unfamiliar with the condition and caused a lack of understanding (Ariyanti, 2020). The lectures did ineffective instruction by designing and planning learning activities unrelated to the learning objectives to be achieved (Syauqi et al., 2020). The students were also found difficulty in understanding the material delivered through online learning (Sadikin & Hamidah, 2020). The absence of face-to-face learning also caused the students' lack of understanding (Purwasih et al., 2020). Lack of understanding felt by the students was also caused by the uncomfortable feeling that happened during the online learning, unable to operate the technology well, and lack of self-confidence to ask questions related to the material to the lecturer (Rojabi, 2020). Most of the students' understanding of the material after the online learning was unsatisfying and showed that they did not have a sound understanding of the material (Susila et al., 2020). Learning media offered and lecturer's explanation not maximum thus the students unwell understood the course material (Ningsih, 2020). Online learning did not help the students comprehend the material (Fitriani et al., 2020). Limited interaction that happened during the online learning between the students and lecturer and the material was explained indirectly made the students sometimes did not catch the material given by their lecturer (Hamid et al., 2020).

Asynchronous online learning students also stated that their understanding was lacking because of the ineffective instruction. Students could not focus well, and thus they failed to comprehend the material during the online learning (Daroedono et al., 2020). The lack of understanding caused by the teaching strategy used by their lecturer gave the students tasks to be done without explaining the material to the students, so the students were confused (Yulandari, 2020). The student's understanding of the material given through online learning was depended on the material. However, sometimes, the students understood the material slower when it was compared to the face-to-face meetings (Nugroho, 2020). Students disagreed that online learning made their learning more organized, so the unorganized online learning made the students not understand well the material delivered during the online learning (Anim & Mapilindo, 2020). Moreover, the students whose learning activities needed a particular activity, such as practicum, felt it was difficult to understand the material for the practicum through online learning (Maulana & Hamidi, 2020).

Health issue

There was a health issue that was also found in the implementation of synchronous online learning. Online learning made the students long to sit in front of their learning tools such as gadgets, computers, or smartphones. Furthermore, online learning made the students need to stare at the screen more than usual. The learning materials were sent through online platforms,

the learning materials were red through the screen, and the students should watch a learning material in the form of a video that might have a long duration. The long duration of online learning and all the online activities affected the students' health.

Table 9. Factors that affected students' health issues during online learning in the middle of the COVID-19 pandemic.

No	Health issue	Synchronous	Asynchronous
1	Headache	√	-
2	Sore eyes	√	-
3	Stress	√	-

Table 9 showed that the significant health issues that the students felt during online learning in the middle of the COVID-19 pandemic were headaches, sore eyes, and stress. The synchronous online learning students faced those health issues. The internal disadvantage which the students felt was a health issue. The online learning implementation during the pandemic of COVID-19 affected the students' physical part. Some students were having a problem with their health during online learning such as having a headache and sore eyes because of the long duration of the online learning (Ariyanti, 2020). As the teacher gave materials that students have to read especially when it used "share screen" and the teachers used PowerPoint, it would make the students keep read while staring at the screen. Health issues as internal disadvantages would not appear straight after students have done their online classes. When online classes occurred every single day for a long duration and students have to watch their screen, it gives bad effects on their health (Ariyanti, 2020). Besides, unpredictable changes in the assignment's deadline affected the students' minds and caused stress (Tanjung & Utomo, 2021).

CONCLUSION

Indonesia's higher students' perceptions towards online learning during the pandemic of COVID-19 showed various perceptions. The perceptions were categorized into positive and negative perceptions. There were four main positive perceptions revealed from twenty-two studies conducted, namely flexibility, availability of learning material, motivation, and variations of online platforms. The flexibility offered by online learning came out from the time, place, and learning styles flexibility. Students could access and learn at any time and anywhere. Besides, the students were flexible and free to choose the learning styles to comprehend the material. Most studies found that the material delivered during the online learning was relevant to the lesson plan of the course. Online learning was challenging and attractive for the students since it used various teaching techniques. Thus, the students were motivated to learn more. However, online learning also gained negative perceptions from college students. There were five main negative perceptions collected from the twenty-two previous studies. The negative perspectives were internet access, unstable internet connection, lack of interaction, ineffective instruction, and health issues. The major problems which the students faced during the online learning were internet access and unstable internet connection. The students need extra internet quota, unstable internet connection, and different states caused different signal strength. Indirect or even no explanation from the lecturer, lack of concentration, and lack of use to online learning made the absorption of the material lacking. Besides, the interaction during online learning was also lacking. Online learning limited the direct interaction between students-students and lecturer-students, and it caused boredom. The last negative perception was a health issue. The students spent more time sitting down, facing a computer or other devices, and the long duration of online learning caused headaches and sore eyes for the students. Conclusively, the implementation of online learning at higher education in Indonesia gave positive and negative experiences for the students. However,

online learning may be the best choice to be implemented in the middle of the COVID-19 pandemic in Indonesia.

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THE ROLE OF LINGUISTIC LANDSCAPE IN SUPPORTING INCLUSIVE EDUCATION: A SYSTEMATIC LITERATURE REVIEW (2020-2025)

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ABSTRACT

Linguistic landscape is commonly found in public spaces through signs, information, boards, posters, directional signs, and other visual displays. In the context of education, these displays become part of students' daily learning experiences and may influence how they interact with their surroundings. Previous studies have discussed linguistic landscape in relation to multilingualism and language learning. However, its role in supporting inclusive education has received less attention. This study aims to explore how linguistic landscape supports inclusive education based on studies published between 2020 and 2025. A systematic literature review was chosen using the PRISMA framework. Ten articles were selected based on inclusion criteria and analyze the contribution of linguistic landscape to inclusive educational practices. The results show that linguistic landscape supports inclusive education in several ways. It reflects inclusive values and policies within educational settings, improves accessibility through visual, tactile, and navigational resources. These findings suggest that linguistic landscape can be used as a resource to create learning environments that are more inclusive, assessable, and responsive to the needs of diverse learners.

Keyword: accessibility, inclusive education, linguistic landscape

INTRODUCTION

Schools today serve students with diverse backgrounds, abilities, and learning needs. This diversity makes the school environment an important aspect of the educational process. In this context, schools are expected to provide a learning environment where all students feel accepted, supported, and able to participate in learning activities. However, creating such an environment remains a challenge in many educational settings. Some students still experience barriers that limit their participation and learning opportunities. According to UNESCO (2023), a supportive learning environment contributes to students' cognitive, social, and emotional development. In Indonesia, the Ministry of Education also emphasizes the importance of promoting inclusiveness, and respect for diversity in educational settings (Kemdikbud, 2022). These principles are related to Sustainable Development Goal (SDG) 4, which aims to ensure inclusive and equitable education for all learners.

In this context, inclusive education is not limited to students with disabilities. It also includes learners with different cultural backgrounds, language differences, learning difficulties, and various social conditions (Ainscow, 2020; Padmadewi, Artini, et al., 2024). Creating an inclusive environment is influenced by many factors, including teaching practices and the physical environment. Elements such as visual design, space organization, language use, and symbolic representations can affect students' sense of belonging, identity, comfort, and participation in learning activities.

One aspect of the school environment is linguistic landscape (LL). Landry and Bourhis (1997) introduced this concept to describe the use of language in public spaces through signs, posters, and various other visual representations. In an educational context, this concept extends beyond the study of written signs. Gorter (2018) introduced the concept of the schoolscape, which views the visual and linguistic elements in schools as representations of institutional identity, cultural values, and language ideology. From this perspective, the linguistic landscape becomes part of the learning environment that shapes students' daily experiences.

Various studies show that the linguistic landscape can support the learning process in various ways. Gorter and Cenoz (2017) suggest that the presence of multiple languages in the school environment can support language learning and strengthen students' linguistic identities. Bernado-Hinesley (2020) also found that the presence of multiple languages helps acknowledge students' cultural and linguistic backgrounds. In addition, Malinowski (2020) states that visual messages displayed in schools influence how students perceive language, language users, and their own positions as learners. These findings suggest that L can contribute to creating a learning environment that values diversity.

Linguistic landscape is not only related to language learning but can also contribute to inclusive education. In the context of education, signs, visual symbols, simplified texts, and navigation systems can make information easier to access, especially for students who depend on visual support or experience difficulties in processing information (Evans & Boucher, 2015). The presence of multilingual signs may also help students from different linguistic backgrounds feel acknowledged and welcomed within the school community (Paris et al., 2017). In this way, linguistic landscape can support the creation of learning environments that are accessible and inclusive for learners.

Studies on inclusive education in Indonesia have mostly focused on factors such as teacher attitudes, empathy, and social cultural values (Padmadewi et al., 2024; Padmadewi et al., 2024; Situmorang & Pipit, 2025). These studies have contributed to a better understanding of how inclusive practices can be implemented in schools. However, less attention has been given to the role of linguistic landscape as part of the learning environment. As a result, there is still a need to explore how linguistic landscape can support accessibility, represent diversity, and encourage the participation of students in inclusive

Many studies published between 2020 and 2025 have discussed linguistic landscape, especially in relation to multilingualism and language learning. However, only a few studies have discussed linguistic landscape from the perspective of inclusive education. As a result, there is still limited information about how linguistic landscape can support inclusive learning environments. To fill this gap, this study explores studies related to linguistic landscape and inclusive education published between 2020 and 2025. The review was conducted using the PRISMA framework. This study focuses on answering the following question: How is linguistic landscape used to support inclusive education practices during the 2020-2025 period?

METHOD

This study uses a Systematic Literature review (SLR) approach to examine how the linguistic landscape is discussed in supporting inclusive education practices during the period 2020-2025. This approach was chosen because it allows a clear and organized process of identifying, selecting, and reviewing relevant in a transparent manner. To report the article selection process, this study follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines, as outlined by Page et al., (2021). The PRISMA guidelines were used to outline the review process and illustrate of article identification, screening, and inclusion.

(a) Data collection technique

The articles included in this review were collected from three databases: Google Scholar, ERIC, and ScienceDirect. The search was limited to publications from 2020 to 2025 in order to capture the recent studies related to linguistic landscape and inclusive education. Keywords were arranged using Boolean operators, such as “linguistic landscape” OR “schoolscape” AND “inclusive education” OR “inclusion” OR “accessibility” OR “diversity.” At the initial stage, broader terms including education, multilingualism, and social inclusion were also used to ensure that relevant studies were not missing, especially those that did not

explicitly mention inclusive education. Through this search process, a total of 88 articles were identified. These articles were then filtered using predefined inclusion and exclusion criteria to determine those that were relevant to the focus of the study.

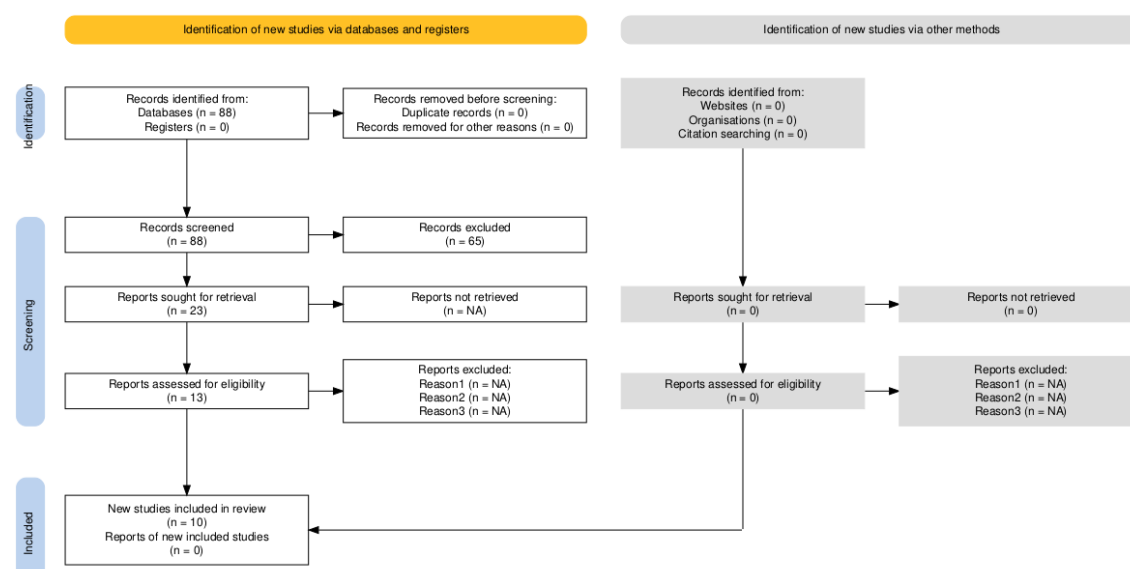


Figure 1. Visual representation of the search and selection process basen on (Page et al., 2021)

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Discusses linguistic landscape, schoolscape, or visual linguistic phenomena in educational context	Discusses linguistic landscape in non educational context
Related to inclusivity, diversity, accessibility, social representation, or student participation	Not related to inclusivity issues, wheter pedagogical, social, or policy-related
Full text articles are available and accessible	Full text articles are not available or cannot be accessed
Published between 2020-2025	Published outside the 2020-2025

(b) Data analysis

In this study, Inclusion and exclusion criteria were applied to ensure that the selected articles were aligned with the research focus. After the initial screening, 23 articles that were reviewed in full to determine their final eligibility. During this stage, each article was examined by considering the depth of its discussion, the clarity of the educational contexts, and its relevance to understanding how the linguistic landscape supports inclusive education practices. The full- text reviewed indicated 13 articles did not meet the inclusion criteria because their discussion was too general, lacked empirical evidence or relevant analysis. As a result, 10 articles were identified as suitable and were included for further analysis in this review.

RESULT AND DISCUSSION

Result

The results of a systematic review of ten articles thoroughly evaluated and meeting inclusion criteria indicate that LL are used in inclusive education in various forms and roles. Overall, LL is not only used as a visual tool in the classroom. Instead, it aids in language learning and multicultural understanding, increases accessibility for students with special needs, and communicate diversity. The results show that LL actively influences students' learning experiences, social interactions, and access to a more equitable and inclusive educational environment.

Table 2. Overview of studies included in this systematic review

No	Author & Year	Method	Context	Main Findings
1	(Ruffin, 2025)	Qualitative study	Higher education	Linguistic landscape reflects changing institutional commitments to diversity and inclusivity. Changes in language and symbol related to DEI indicate ideological and policy shifts, not only visual changes.
2	(Hossain, 2024)	Literature review	English language learning	Cultural elements present in the learning environment play an important role in creating inclusive language learning. The linguistic landscape can be a means of instilling cultural values that influence student engagement.
3	(Hu, 2022)	Qualitative study	Inclusive education for people with visual impairment	Element such as tactile signs, spatial markers, navigation systems, and Braille-based information are important parts of an inclusive learning environment that supports student independence and safety.
4	(Awang et al., 2024)	Qualitative study	Special needs	Although inclusive education policies have been developed, limited resources and implementation gaps still hinder the realization of a disability-friendly linguistic landscape, especially in rural areas.
5	(Dean-scott & Haber-currant, 2025)	Qualitative study	Higher education	Anti-DEI policies have an impact on language use on campus and inclusivity. The

				linguistic landscape is an indicator of institutional values and power relations in higher education.
6	(Fernée & Trimmis, 2020)	Case study	Refugee and asylum-seeking learners	Student engagement in exploring the linguistic landscape of the city, combined with a drama approach, helps in second language acquisition and strengthens a sense of belonging and social inclusion.
7	(Yavuz et al., 2024)	Quantitative study	Public and educational spaces	Linguistic landscape is dominated by national and global languages, so that minority languages are less visible and influence perceptions of language validity in the context of education.
8	(Prasatyo et al., 2025)	Qualitative study	Higher education	Students have a positive attitude toward regional languages but their use of these languages in academic context remain very limited, indicating a gap between attitude and practice.
9	(Suejam et al., 2025)	Action research	ELICOS classroom	The use of linguistic landscape as a learning medium increase students' awareness of multilingualism and helps develop language skills through exposure to language in real life.
10	(Al-jarf, 2021)	Classroom based study	Students studying abroad	The use of linguistic landscape in English language teaching helps develop vocabulary, reading comprehension, and contextual language use.

The table above summarizes the ten articles analyzed in this systematic literature review. The information presented includes the author's name and year publication, research design, study context, and key findings related to the use of LL in supporting inclusive education practices. All of these articles were published between 2020 and 2025, indicating that studies on LL in the field of inclusive education are still relatively new and continue to develop, in line with the increasing attention to issues of diversity, accessibility, and equity in education. In general, the findings from the ten articles show that LL has been used to support inclusive education practices in various forms and functions. Although its application is

influenced by the social context, education policies and the availability of resources in each region.

Discussion

This comprehensive evaluation shows that the learning environment LL should be considered part of the learning environment rather than just an additional decoration or visual display in the classroom in inclusive education. Of the ten articles evaluated, LL appears to strongly support the value of inclusion, ensuring that students with special needs can participate, and creating a language learning space through interaction with real texts in their surroundings. According to Landry and Bourhis (1997), the linguistic landscape reflects social identity and power relations in public spaces. In education, the learning environment can influence whether students feel accepted and engaged in the learning process.

Institutional commitment is very important for achieving justice, especially in terms of policy design and the learning environment, according to recent discussions on inclusive education Singh et al., (2024). In situations like this, LL can be considered part of everyday school practices that convey shared values, show who is enrolled, and point the way forward for education. One piece of evidence about how ideology is embedded in these practices is the changes that occur in language, symbols, and public discourse on campus after the implementation of anti-DEI policies. As demonstrated by Ruffin (2025) as well as Dean-scott and Haber-curren (2025), the changes in language, symbols, and public discourse on campus following the implementation of anti-DEI policies indicate a deeper ideological shift than merely visual changes. This perspective supports Shohamy (2006) idea of the linguistic landscape as a de facto language policy, where ideology is manifested through everyday actions in the broader educational context.

This review emphasizes the difference between inclusive practices and symbolic representation. The existence of inclusive educational practices does not always mean the existence of inclusive symbols or terms. This is in line with the idea put forward by Ainscow (2020) that inclusive education is a long-term systemic transformation process. Padmadewi et al., (2024) found that when the learning process is carried out reflectively and contextually in real classroom experiences, prospective teachers better understand inclusive education. This shows that inclusive values are not only represented symbolically; they must also be included in institutional culture, educational practices, and consistent support systems.

LL is very important for improving accessibility, especially for students with disabilities. Studies by Hu (2022) and Awang et al., (2024) found that the independence, sense of security, and spatial orientation of students with visual impairments were improved by tactile markers, spatial navigation systems, and Braille-based information. These results align with research conducted by Dewi et al., (2025), which emphasizes that environmental readiness and support systems are vital for the success of inclusive programs for students with autism spectrum disorder (ASD). Kurniawati (2020) also found that a learning approach enabled a student with ASD to participate more actively in the learning process. In such situations, LL should be considered an important component of educational infrastructure that supports the principles of Universal Design for Learning (UDL), which aims to accommodate student diversity from the outset.

The use of language in inclusive classrooms demonstrates the importance of an adaptive environment. According to research conducted by Tobing et al., (2026) and Duniangella et al., (2024) visual aids, concrete materials, and multimodal approaches are important components in teaching students with English language hearing impairments. These results demonstrate the function of LL as a visual resource that can be used to increase student participation, reduce communication barriers, and create a more welcoming classroom

environment. Therefore, LL not only conveys information but also serves as a learning aid that helps students feel safe and engaged.

LL has the potential to be used in education as a relevant and contextual learning resource. According to Padmadewi et al., (2023), the application of LL in project-based learning improves students' language skills, character values, and active engagement. ELICOS has a similar pattern (Al-jarf, 2021; Suejam et al., 2025), where language proficiency, multilingual awareness, and identity reflection are strengthened by interacting with authentic texts in the surrounding environment. Furthermore, community-based and cultural heritage approaches emphasize LL as a tool for social empowerment, especially for vulnerable groups such as asylum seekers and refugees who face issues of belonging and identity (Fernée & Trimmis, 2020).

From a sociolinguistic and critical education perspective, LL also reflects power relations and language hierarchies that impact educational equity. Studies by Yavuz et al., (2024) and Prasatyo et al., (2025) show that the dominance of certain languages in public and academic spaces results in low visibility for minority languages. These findings are closely connected to the concept of a culturally responsive learning environment (Hossain, 2024) and a peace education approach that emphasizes open dialogue, diversity, and social justice (Mahayanti et al., 2025). In this context, LL can serve as a symbolic medium for instilling the values of diversity, dialogue, and social cohesion in education.

This review shows that LL supports inclusive education in three main areas: inclusive ideology and values are represented, the learning environment is accessible, and pedagogical practices promote social inclusion and multilingual awareness. However, the success of LL depends on the sociopolitical context, institutional commitment, resource availability, and its integration with pedagogical practices and other support systems. As a result, LL cannot be considered an independent approach, but rather an essential component of a systematic and long-term commitment to achieving equitable, inclusive, and sustainable education.

CONCLUSION

Based on a systematic review of ten articles published between 2020 and 2025, this study shows that LL plays an important role in supporting inclusive education through various functions. The existence of LL in schools and universities not only provides visual information but also reflects the values ideology, and level of institutional commitment to the principle of inclusivity. In addition, LL has a clear practical function in improving the accessibility and independence of students with special needs, for example through the use of clear visual, directional signage, and the presentation of easily understandable information. From a pedagogical perspective, LL also has great potential, especially in language learning, as it allows students to develop multilingual awareness while strengthening social inclusion through direct engagement with language practices present in everyday life. The main strength of this study is the application of a systematic literature review method conducted in a structured manner with reference to the PRISMA guidelines, so that the process of searching, selecting, analyzing articles can be carried out transparently and systematically, and placing LL specifically in the framework of inclusive education, which is still relatively rarely discussed, especially in the context of education in Indonesia. However, this study has limitations, including the limited number of articles analyzed, most of which were from overseas contexts, so that the findings need to be interpreted carefully when applied to the local context, as well as methodological limitations because it was not possible to directly observe LL practices in the field. Therefore, future research is recommended to empirically examine the implementation of LL in inclusive schools, especially in Indonesia, involving the perspective teachers, students, and school administrators, while in practical terms, the findings of this study indicate that LL can be used by educators that supports the participation of all students, so that

LL is no longer seen only as a visual element, but as a strategic component in realizing inclusive education.

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AN ANALYSIS OF TEACHER STRATEGIES IN TEACHING READING COMPREHENSION OF CLASS VII STUDENTS IN SMPN 12 DENPASAR

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ABSTRACT

The aims of this study is to find out what strategies are used in teaching reading comprehension and analyze the strenghts and weakness of the strategy at SMPN 12 Denpasar, focusing on Class VII Students. This research used observation, interview, and content analysis to obtain data. The data was analyzed by using data reduction techniques, data display, and conclusion drawing/verification. The researcher found that the teachers employ knowledge activation, prediction, vocabulary, and games. Although there is a lack of time and unequal involvement, these tactics boost student motivation and preparedness. While reading, understanding key concepts and particular details is aided by skimming, scanning, and peer discussion. The drawbacks include inconsistent supervision and certain passive students. Q&A and games improve understanding and reflection. The drawbacks include little time for introspection and a narrow range of activities. Although more involvement and time management were required, the teacher's approach of combining cognitive, metacognitive, and social/affective tactics was generally successful.

Keywords: Reading Comprehension, Teaching Strategies, Reading Skill, Reading Technique

INTRODUCTION

The importance of strategy in the teaching and learning process cannot be underestimated. Strategy is procedural, while the approach is axiomatic; there are several strategies in one approach. This strategy then becomes a teaching method in the learning process. Intense use of strategies is needed to help students' learning and understanding. Teaching strategies are assumed to be a means to achieve something in the teaching process. The teacher can achieve the objectives of the teaching plan because of the strategies implemented. There are strategies for teachers to teach reading comprehension (Sofyan et al., 2020). Some of them are using authentic and approximate materials, reading aloud in front of the class, understanding questions, determining the effect of text difficulty, and using pre-reading activities to prepare students for reading. Other strategies teachers can use include expanding students' vocabulary, getting to the core material, using contextual cues, visualizing what is written, providing variety for reading purposes, and identifying texts and assignments. (Nurhamidah et al., 2018).

Reading is the process of gathering information to understand the meaning and significance of the text being read. Most people argue that reading without meaning and understanding is not reading. The purpose of reading is to share information with others, which can increase our knowledge in a particular field. In other words, reading is the best way for students to learn new things and expand their knowledge of the world. Reading allows us to understand and comprehend so that the message can be received properly. It can be concluded that when reading, readers will actively discover what the text means and explore the meaning of the text, the questions that arise after they understand the text they read. Reading is an activity that a person does to analyze the message or meaning that the author wants to convey in the text. Students who are too lazy to read will find it difficult to learn new things for themselves. In contrast to reading lessons in Indonesian, reading receives special attention in second or foreign language teaching. Reading is the process of understanding the text. That is, when we read, we try to understand the actual meaning of the words, and we can draw our conclusions about the text after reading it carefully. The reader's concentration and ability to

recognize and analyze the text determines how well and quickly he or she comprehends it. If students master vocabulary, they will be better able to understand the intent and purpose of the text, as well as train their ability to guess which information is obtained from previous experience. The ability to read is an achievement for those who are serious and focused in reading. Reading opens a window where many insights can be gained and is one of the ways to get as much information as possible. With this, students must understand and comprehend the purpose of the text. They must be able to understand, identify, and translate what they have read to do so. Therefore, students must make a concerted effort to learn and read. We need strategies to facilitate comprehension. Strategies that are used together to solve problems and extract information from texts. Reading is a complex process and a subject that should be taught to students (Audina et al., 2020a). Reading comprehension is the ability to understand or interpret written or printed materials that contain information, involving mental activity to understand the researcher's intent (Saputri & Afriani, 2021a). Teaching reading comprehension is a complex process that involves more than just passing information from teacher to student. Many activities can be done, especially during the teaching and learning process in the classroom. Reading is an interactive activity in which meaning from written material is selected and understood (Rombot et al., 2020a). Comprehension depends not only on the reader's prior knowledge or working memory, but also on basic reading skills, vocabulary, elaboration, text structure, and motivation (Rombot et al., 2020b). Reading comprehension is the 'process of constructing meaning' from text or how to understand what is read. Catts states that individual differences in these two components have been shown to explain differences in reading comprehension across languages, although the relative relationships of the components change over time (Elleman & Oslund, 2019). Perfetti, Landi, and Oakhill state that reading comprehension requires various linguistic and cognitive processes, including but not limited to word reading, working memory, reasoning, comprehension, vocabulary, and prior knowledge. (Elleman & Oslund, 2019). Several studies on reading comprehension have been conducted. This is because reading comprehension seems to have an impact on other subjects in primary school.

The researchers had conducted several literature review regarding teaching reading strategies, first was by (Chotimah, 2022), "An Analysis of Teachers' Strategies in Teaching Reading Comprehension at Tenth Grade Students of Vocational High School 2 Malang", the research was conducted to comprehend the teacher's strategy in teaching English by using descriptive qualitative methods to the senior English teacher at State Vocational High School 2, Malang as the subject. For data collection techniques, researchers used interviews, observations, questionnaires, and documents. The results of the study show that the teacher used a lesson plan by considering important elements such as objectives, activities, and learning media, and reading teaching strategies used are QARs and meta-cognitive strategies. The teacher divides the activities into 3 activities, namely pre-reading activities, during-reading activities, and post-reading activities. To implement reading comprehension learning the teacher uses tools such as WhatsApp, Google Meet, and YouTube. (Alfian, 2018) "An Analysis of Teachers' Strategies in Teaching Reading Comprehension at SMA Negeri 5 Bone." The purpose of this study was to determine the reading comprehension strategies used by teachers and students' perceptions of the strategies used by teachers. This type of research is descriptive qualitative. The instruments used were observation and questionnaires. The result of this study is that the teacher used two methods in teaching English, namely Reciprocal Teaching and QAR. And students' perceptions of the two methods used by the teacher show that students understand more easily and can convey or change their opinions, get new ideas, and be motivated students in learning. (Nurdin, 2021) "Teachers' Strategies in Teaching Reading Comprehension at SMP IT AL-GHOFAR during Covid-19" The purpose of this study is to find out the reading teaching strategy and how to implement the reading teaching strategy at

“SMP IT Al-Ghofar during Covid-19”. This research uses a qualitative approach by using the instruments of observation, interview, and documentation. Data is obtained through data reduction, data display, and conclusion. This study used 2 English teachers as participants. The results of this study show that teachers at “SMP IT Al-Ghofar during COVID-19” use 3 reading teaching strategies: QARs, semantic mapping, and translating simple paragraphs. The two teachers implementing the reading teaching strategies are the same, namely by using WhatsApp groups and giving assignments.

Based on previous research studies there are similarities with this study, namely previous researchers conducted research on reading comprehension teaching strategies, but there are some differences, namely in the object of research, and the place of research and different grade levels, the reason the researcher chose in SMPN 12 Denpasar because this school has good learning quality, the second reason the researcher took in grade 7 because the learning process in grade 7 is still very BASIC, so the quality of reading comprehension teaching really determines the reading quality of grade 7 children in the future so that teachers must choose the right teaching method, the third reason the researcher conducted research in class VII because in this class the average ‘student’ has good reading comprehension.

METHODS

The researcher analyzed the methods used by teachers and determine the strengths and weaknesses of the teaching strategies employed by teacher in teaching reading comprehension. This research will be in three stages, the first is interviewing the English teacher, the second is observing the teaching and learning process in class VII SMPN 12 Denpasar, and the third is documentation to support the research. This research uses interview, observation, and documentation methods. In this research process, the researcher will ask what reading comprehension strategies are used by English teachers in class VII SMPN 12 Denpasar.

Data analysis was done qualitatively to describe what is in the data. This was done by using documentation and interviews to collect data. Qualitative data analysis is the process of managing data, and organizing it into patterns, categories, and basic description units. In qualitative research, data analysis is usually done simultaneously or concurrently with data collection, due to its messy and non-linear nature. Researchers used data reduction techniques, data display, and conclusion drawing/verification which are three processes that occur simultaneously that form the analysis.

FINDING AND DISCUSSION

Based on the results of interviews and observations, researchers found that class VII teachers at SMPN 12 Denpasar used 3 learning methods: QARs, and Skimming-Scanning.

The results demonstrate that the teacher used techniques like games, prior knowledge activation, text content prediction, and the introduction of important terminology throughout the pre-reading phase. While cognitive methods assisted students in effectively processing new information, metacognitive strategies were aided by these activities, which encouraged students to consider what they already knew and predict the text. Additionally, because students loved the learning process and worked in teams, the use of games encouraged social and emotional techniques. Students' mental preparation, motivation, and prior knowledge activation were all enhanced by the pre-reading exercises. Games boosted interaction and lowered reading anxiety. However, despite these benefits, not all pre-reading exercises were implemented consistently, and some students were passive or unduly reliant on the teacher's direction. Participation in other games was also limited by time constraints This is in line with Vacca's (2021) assertion that pre-reading techniques should stimulate students' cognitive and metacognitive development in order to increase their comprehension readiness. According to the research, interactive pre-reading exercises—especially games—can also improve affective

engagement, which promotes social interaction and motivation. However, teachers should make sure that all students participate equally and that the activities are varied in order to enhance efficacy.

The teacher used peer conversations and skimming and scanning techniques during the reading phase. Students were able to swiftly understand the key concepts by skimming (cognitive approach). Students learned how to efficiently find specific details by scanning (cognitive approach). Students were encouraged to communicate and validate their learning through peer conversation, which reflected social and emotional techniques. As students assessed the precision of their comprehension, monitoring comprehension revealed metacognitive techniques. This technique help monitoring raised awareness of understanding, peer conversation boosted engagement, and skimming and scanning improved reading efficiency. However, the weakness of this technique is time limits restricted comprehension depth, some pupils were inactive, and monitoring was uneven. The results corroborate the theories of cognitive reading methods (Vacca, 2021), which claim that scanning and skimming help with comprehension and information processing. Combining social engagement with metacognitive reflection improves comprehension and promotes cooperation and self-control. However, precise timing and active participation from every student are necessary for successful implementation.

Games and Q&A were used in the post-reading phase to strengthen understanding and introspection. Students were able to recollect and assess material (cognitive & metacognitive) with the use of Q&A and Playing games encouraged participation, cooperation, and self-assurance (social & affective). This activity improved motivation, promoted critical thinking, and strengthened comprehension. However, Reflective exercises were time-limited, some kids did not engage equitably, and there was occasionally a limited selection of games. These results are in line with Vacca's (2021) findings, which emphasize how post-reading exercises strengthen comprehension and encourage metacognitive thinking. Learning becomes more meaningful when games and group Q&A sessions promote positive social interaction and affective involvement. To optimize the advantages for every student, educators should guarantee time management and a variety of activities. Overall, the teacher integrated cognitive, metacognitive, and social/affective methods throughout the pre-reading, during-reading, and post-reading phases in a methodical and theoretically aligned manner. Although the tactics were largely successful, there may be room for improvement given the constraints on time, student involvement, and activity diversity. Learner engagement and reading comprehension can be further improved by applying metacognitive and social tactics consistently.

CONCLUSION

Based on the results of research conducted by researchers through content analysis, observation, and interviews. Teachers employ knowledge activation, prediction, vocabulary, and games. Although there is a lack of time and unequal involvement, these tactics boost student motivation and preparedness. While reading, understanding key concepts and particular details is aided by skimming, scanning, and peer discussion. The drawbacks include inconsistent supervision and certain passive students. Post-Reading: Q&A and games improve understanding and reflection. The drawbacks include little time for introspection and a narrow range of activities.

Although more involvement and time management were required, the teacher's approach of combining cognitive, metacognitive, and social/affective tactics was generally successful.

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INTERACTIVE DIGITAL DICTIONARY DEVELOPMENT TO ENHANCE ENGLISH VOCABULARY MASTERY AND READING ABILITY THROUGH SELF-REGULATED LEARNING AMONG JUNIOR HIGH SCHOOL STUDENTS

A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

The rapid expansion of digital technology in English as a Foreign Language (EFL) instruction has generated significant interest in interactive digital dictionaries as tools for vocabulary acquisition and reading development. However, systematic evidence consolidating the effectiveness of such tools across multiple learning outcomes, particularly within the framework of Self-Regulated Learning (SRL), remains limited. This study aims to systematically review empirical literature on the development and effectiveness of interactive digital dictionaries in enhancing English vocabulary mastery, reading ability, and self-regulated learning among Junior High School students (SMP). Following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, articles were retrieved from three major academic databases: Scopus, Web of Science, and ERIC, using predefined Boolean search strings. Inclusion criteria focused on peer-reviewed journal articles published between 2014 and 2024 that addressed interactive digital dictionaries in EFL contexts with measurable learning outcomes. A total of 1,248 records were initially identified; after screening and eligibility assessment, 45 articles were included for final synthesis. Findings reveal that interactive digital dictionaries, when designed with multimodal features, contextual scaffolding, gamification, and adaptive personalization, significantly enhance vocabulary mastery across breadth, depth, and fluency dimensions. Reading ability improves substantially when digital glossaries are embedded within authentic reading tasks. Self-regulated learning emerges as a critical mediating variable: digital dictionary features supporting goal-setting, self-monitoring, and self-evaluation strengthen learners' regulatory strategies and amplify vocabulary and reading outcomes. Research gaps are identified, including the underrepresentation of secondary school EFL learners, the scarcity of delayed post-test designs, and limited studies from Southeast Asian contexts. This review contributes a synthesized evidence base and design framework for developing interactive digital dictionaries that simultaneously target vocabulary mastery, reading proficiency, and self-regulated learning in Junior High School EFL settings.

Keywords: interactive digital dictionary, EFL learning, vocabulary mastery, reading ability, self-regulated learning

INTRODUCTION

The integration of digital technology in English language teaching and learning has profoundly reshaped instructional practices across educational contexts worldwide. Among the array of technology-enhanced learning tools available to EFL educators and learners, interactive digital dictionaries have emerged as particularly promising resources for vocabulary instruction and reading comprehension development. Unlike conventional print dictionaries, which provide static, text-based definitions, interactive digital dictionaries incorporate multimodal features — including audio pronunciation by native speakers, contextual video examples, visual illustrations, animated definitions, gamification elements, and adaptive review mechanisms — that collectively create richer and more engaging vocabulary learning experiences (Godwin-Jones, 2021).

The importance of vocabulary mastery to overall English language proficiency cannot be overstated. Extensive research in applied linguistics and second language acquisition has established that vocabulary knowledge is the single strongest predictor of reading comprehension in a second or foreign language (Nation, 2001; Laufer, 1992). The Vocabulary Threshold Hypothesis proposes that learners must recognize approximately 95% to 98% of words in a text to achieve adequate reading comprehension, underscoring the critical role of

systematic vocabulary instruction in EFL settings. Despite the established importance of vocabulary, many Junior High School students in Indonesia and other EFL contexts continue to demonstrate limited English vocabulary knowledge and insufficient reading ability, partly due to the inadequacy of available learning media and the reliance on conventional teaching approaches that emphasize rote memorization over meaningful contextual engagement (Zhang & Zou, 2023).

The concept of Self-Regulated Learning (SRL) has gained increasing attention as a theoretical framework for understanding how learners actively manage their own learning processes. Zimmerman (2000) defines SRL as the degree to which learners are metacognitively, motivationally, and behaviorally active participants in their own learning. In the context of vocabulary acquisition and reading development, SRL encompasses goal-setting for lexical targets, strategic selection of learning resources, self-monitoring of vocabulary knowledge, and self-evaluation of reading comprehension. Interactive digital dictionaries, through features such as personalized word lists, learning analytics dashboards, spaced repetition systems, and self-testing functions, are theoretically well-positioned to scaffold SRL processes among EFL learners. However, the empirical relationship between interactive digital dictionary use and SRL — and the mediating role of SRL in connecting digital tool use to vocabulary and reading outcomes — remains underexplored in the existing literature.

Furthermore, while several reviews have examined the effectiveness of Computer-Assisted Language Learning (CALL) tools broadly (Godwin-Jones, 2021), or have focused on specific digital vocabulary applications such as electronic flashcard systems (Başal et al., 2020), no comprehensive systematic review has specifically examined interactive digital dictionaries as tools that simultaneously target vocabulary mastery, reading ability, and self-regulated learning among Junior High School students. This gap represents a significant limitation in the evidence base available to educators, curriculum designers, and educational technology developers working in EFL secondary school contexts.

This systematic literature review therefore aims to address the following research questions:

1. RQ1: What are the research trends in the use of interactive digital dictionaries for EFL vocabulary and reading learning from 2014 to 2024?
2. RQ2: What is the evidence for the effectiveness of interactive digital dictionaries in enhancing vocabulary mastery among EFL learners, particularly at the secondary school level?
3. RQ3: How do interactive digital dictionaries influence reading ability in EFL contexts, and what features are most strongly associated with reading comprehension gains?
4. RQ4: What is the role of self-regulated learning as a mediating or outcome variable in the relationship between interactive digital dictionary use and EFL learning outcomes?
5. RQ5: What research gaps exist in the current literature, and what implications do these gaps have for the development of interactive digital dictionaries for Junior High School EFL learners?

The findings of this review are intended to provide a synthesized evidence base for the development of an interactive digital dictionary specifically designed to improve English vocabulary mastery, reading ability, and self-regulated learning among Junior High School students (Siswa SMP) in the Indonesian EFL context.

LITERATURE REVIEW

Interactive Digital Dictionaries in EFL Contexts

Interactive digital dictionaries represent a significant evolution beyond conventional electronic dictionaries, which primarily offered digital access to static word definitions. Contemporary interactive digital dictionaries integrate multiple modalities and interactive features that transform the dictionary lookup process from a passive information retrieval activity into an active vocabulary learning experience. Godwin-Jones (2021) characterizes

modern digital dictionaries as tools that embed audio pronunciation, visual illustrations, example sentences in authentic contexts, collocational patterns, usage frequency information, and learner-responsive exercises within a single accessible platform.

The theoretical foundation for understanding why multimodal digital dictionaries enhance vocabulary learning is provided by Paivio's (1986) Dual Coding Theory, which proposes that information encoded through both verbal and visual channels simultaneously creates stronger and more accessible memory traces than information encoded through a single channel alone. When a learner encounters a new word through its written form, hears its pronunciation, sees its visual representation, and reads it in a contextual example sentence — all within a single dictionary entry — multiple cognitive pathways are activated simultaneously, significantly strengthening the probability of long-term retention. Mayer's (2001) Cognitive Theory of Multimedia Learning extends this framework by identifying specific design principles — including the coherence principle, the modality principle, and the personalization principle — that predict when multimedia presentations will enhance learning and when they will impose unnecessary cognitive load.

Vocabulary Mastery: Dimensions and Measurement

Nation (2001) provides the most widely accepted theoretical framework for conceptualizing vocabulary knowledge, distinguishing between three primary dimensions: breadth (the number of words a learner knows), depth (the richness and precision of knowledge about individual words, including collocations, connotations, and syntactic behavior), and fluency (the speed and automaticity of lexical access). Effective vocabulary instruction, and by extension effective vocabulary learning tools, should address all three dimensions rather than focusing exclusively on breadth, as comprehensive vocabulary knowledge requires familiarity with form, meaning, and use across diverse contexts.

In EFL research, vocabulary mastery is typically operationalized and measured using standardized instruments. The Vocabulary Levels Test (Nation, 2001) is the most widely used measure of vocabulary breadth, assessing knowledge of words at the 2,000, 3,000, 5,000, and 10,000 word-frequency levels. The Word Associates Test (Read, 1993) assesses vocabulary depth by measuring learners' knowledge of semantic and collocational associates of target words. Fluency is assessed through timed vocabulary decision tasks or reading fluency assessments that capture the speed of lexical access under time pressure.

The relationship between digital tool use and vocabulary acquisition is theorized through the Task-Induced Involvement Load Hypothesis (Laufer & Hulstijn, 2001), which proposes that vocabulary learning is more effective when the learning task requires learners to need, search for, and evaluate the target word's meaning. Interactive digital dictionary tasks — including contextual glossing during reading, synonym matching exercises, sentence completion with target words, and spaced retrieval practice — impose higher involvement loads than passive definition reading, predicting stronger vocabulary acquisition and retention.

Reading Ability and Vocabulary-Reading Nexus

Reading ability in EFL contexts encompasses several interrelated competencies: decoding fluency (the ability to recognize written words accurately and efficiently), reading comprehension (the ability to construct meaning from written text at literal, inferential, and critical levels), and reading rate (the speed at which text can be processed with adequate comprehension). Among these competencies, reading comprehension is the primary focus of EFL instruction and assessment, as it determines learners' ability to access English-language information for academic, professional, and personal purposes.

The relationship between vocabulary knowledge and reading comprehension has been extensively documented in both first and second language research contexts. Laufer's (1992)

Vocabulary Threshold Hypothesis argues that a minimum lexical threshold must be exceeded before background knowledge and general reading strategies can be effectively deployed in reading comprehension tasks. This threshold is estimated at approximately 95% text coverage for basic comprehension and 98% for unassisted reading of authentic texts. The implication for EFL instruction is clear: learners who lack sufficient vocabulary to exceed the lexical threshold will struggle to comprehend grade-appropriate texts regardless of their background knowledge or strategic reading ability.

Digital glossaries embedded within reading texts — providing definitions, audio support, and visual contextual information for unfamiliar words — have been shown to reduce the cognitive load associated with encountering unknown vocabulary during reading, thereby allowing available cognitive resources to be directed toward comprehension processing rather than word-level decoding (Zhang & Zou, 2023). Research consistently demonstrates that learners who use multimedia digital glosses during reading tasks achieve higher comprehension scores than those using text-only glosses or no glossary support, providing strong empirical support for the integration of digital dictionary features within reading instruction.

Self-Regulated Learning in Technology-Enhanced EFL

Self-Regulated Learning (SRL) is a multidimensional construct encompassing the cognitive, metacognitive, motivational, and behavioral processes through which learners actively direct their own learning toward self-established goals (Zimmerman, 2000). Zimmerman's cyclical model of SRL proposes three sequential phases: the forethought phase (goal-setting, strategic planning, and motivational self-activation), the performance phase (strategy deployment, self-monitoring, and self-instruction), and the self-reflection phase (self-evaluation, causal attribution, and adaptive adjustment of strategies for subsequent learning cycles).

In technology-enhanced language learning contexts, SRL is particularly important because digital tools often provide learners with greater autonomy and flexibility — but also greater responsibility for directing their own learning — compared to traditional classroom instruction. Pham et al. (2021) found that SRL strategies mediated the relationship between digital vocabulary tool use and vocabulary achievement among EFL university students, suggesting that the effectiveness of digital tools depends substantially on learners' capacity to use those tools in self-directed and strategic ways. Learners with higher SRL strategy use demonstrated significantly greater vocabulary gains from digital tool interventions than learners with lower SRL, independent of prior vocabulary knowledge.

Self-Determination Theory (Ryan & Deci, 2000) provides a motivational framework for understanding how digital dictionary features may promote or undermine SRL. The theory proposes that sustained self-regulation requires the fulfillment of three basic psychological needs: autonomy (the experience of learning as self-initiated and volitional), competence (the experience of effective engagement with challenging tasks), and relatedness (the experience of meaningful connection with others in the learning community). Interactive digital dictionary features — including personalized word list creation (supporting autonomy), adaptive difficulty adjustment (supporting competence), and collaborative vocabulary challenges or leaderboards (supporting relatedness) — are theoretically well-positioned to support need fulfillment and thereby enhance intrinsic motivation and SRL.

Conceptual Framework of the Review

Drawing on the theoretical frameworks reviewed above, this systematic review is guided by a conceptual framework that positions interactive digital dictionary features — multimodal content, contextual scaffolding, gamification, and personalized adaptive review — as independent variables whose effects on vocabulary mastery (breadth, depth, fluency) and

reading ability (comprehension, fluency) are mediated by self-regulated learning processes (goal-setting, self-monitoring, self-evaluation, strategic resource use). Learner proficiency level and digital literacy are identified as potential moderating variables that may influence the magnitude of effects on learning outcomes. This framework provides the organizing structure for the evidence synthesis conducted in this review.

METHOD

This study employed a Systematic Literature Review (SLR) methodology following the PRISMA 2020 guidelines (Page et al., 2021) to ensure transparency, rigor, and replicability in the literature search, screening, and synthesis processes. The PRISMA framework provides a structured approach to systematic reviewing that minimizes selection bias and enables readers to evaluate the completeness and quality of the review process.

Database Selection and Search Strategy

The literature search was conducted across three major international academic databases selected for their comprehensive coverage of educational technology, applied linguistics, and second language acquisition research:

1. Scopus — the largest multidisciplinary database of peer-reviewed research, with particularly strong coverage of educational technology and language learning journals;
2. Web of Science (WoS) — a high-impact multidisciplinary citation database with rigorous journal-level quality controls; and
3. ERIC (Education Resources Information Center) — a specialized database focused exclusively on education research, providing comprehensive coverage of EFL and CALL literature.

Boolean search strings were applied to title, abstract, and keyword fields (TITLE-ABS-KEY) in each database using the following terms:

("digital dictionary" OR "electronic dictionary" OR "digital glossary" OR "interactive dictionary" OR "digital glosses") AND ("EFL" OR "ESL" OR "English as a foreign language" OR "English language learning" OR "second language") AND ("vocabulary" OR "vocabulary mastery" OR "vocabulary acquisition" OR "reading comprehension" OR "reading ability" OR "self-regulated learning")

Searches were conducted in February 2024, with date filters applied to restrict results to publications from January 2014 through December 2024. Forward and backward citation searching was additionally performed on the most highly cited included articles to identify relevant studies that may not have appeared in the database searches.

Inclusion and Exclusion Criteria

The following inclusion criteria were applied to determine eligibility for inclusion in the final synthesis:

1. I1: Articles published in peer-reviewed journals indexed in Scopus, Web of Science, or ERIC between January 2014 and December 2024;
2. I2: Articles written in English;
3. I3: Studies examining interactive digital dictionaries, electronic dictionaries, or digital glossaries in EFL or ESL learning contexts;
4. I4: Studies reporting empirical data on at least one of the following outcomes: vocabulary mastery (any dimension), reading comprehension, reading ability, reading fluency, motivation for language learning, or self-regulated learning;
5. I5: Studies involving human participants (EFL/ESL learners at any educational level);
6. I6: Studies employing quantitative, qualitative, or mixed-methods research designs.

Articles were excluded if they met any of the following criteria:

1. E1: Conference papers, book chapters, dissertations, theses, grey literature, or editorial commentaries;
2. E2: Studies focusing exclusively on native English speaker populations without EFL/ESL comparison groups;
3. E3: Studies examining general CALL tools or language learning apps without specifically addressing digital dictionary features;
4. E4: Studies providing insufficient methodological detail to evaluate the rigor of data collection or analysis procedures;
5. E5: Duplicate publications reporting the same data from a previously included study (most recent or comprehensive report retained).

Screening Process and PRISMA Flow

A total of 1,248 records were identified in the initial database searches (Scopus: 542, Web of Science: 412, ERIC: 294). After removing 312 duplicate records using reference management software (Mendeley), 936 unique records were screened by title and abstract. Records were excluded at this stage if they clearly did not address digital dictionaries in EFL/ESL contexts or did not report learning outcome data. Following abstract screening, 92 full-text articles were assessed for eligibility against the complete set of inclusion and exclusion criteria. Forty-seven articles were excluded at the full-text stage for the following reasons: not specifically addressing digital dictionary features ($n = 18$), non-EFL context ($n = 12$), no empirical learning outcome data ($n = 10$), and insufficient methodological rigor ($n = 7$). A total of 45 articles were included in the final synthesis.

Screening was conducted independently by two researchers, with inter-rater reliability assessed using Cohen's Kappa coefficient. Agreement was reached on 93.4% of screening decisions, yielding a Kappa of $\kappa = .87$, indicating near-perfect agreement. Disagreements were resolved through discussion and consensus, with reference to a third reviewer when consensus could not be reached.

Table 1. PRISMA 2020 Flow Summary

IDENTIFICATION
Records identified from Scopus, WoS, ERIC: $N = 1,248$ (Scopus: 542, Web of Science: 412, ERIC: 294)
▼ Remove duplicates → $N = 936$ records
SCREENING
Records screened by title & abstract: $N = 936$ Excluded (irrelevant topic, non-EFL, no digital tool): $N = 690$ → Remaining: $N = 246$
ELIGIBILITY
Full-text articles assessed: $N = 92$ Excluded ($N = 47$): not digital dictionary (18), non-EFL context (12), no empirical data (10), poor methodology (7)
INCLUDED
Final studies included in systematic review: $N = 45$

Figure 1. PRISMA 2020 flow diagram for literature screening and selection

Quality Assessment

The methodological quality of included articles was evaluated using a modified version of the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018), adapted for the specific study types represented in the included literature. Each article was assessed on five quality criteria: (1) clarity and specificity of research questions or objectives; (2) appropriateness of the research design to the stated objectives; (3) rigor of data collection procedures (including sampling adequacy and measurement validity); (4) appropriateness and rigor of data analysis methods; and (5) transparency and completeness of reporting. Studies were rated as high quality (4–5 criteria met), moderate quality (2–3 criteria met), or low quality (0–1 criteria met). All 45 articles included in the final synthesis met at least 3 of the 5 quality criteria, with 31 articles (68.9%) rated as high quality.

Data Extraction and Synthesis

Data were extracted from included articles using a standardized extraction form capturing: author(s), year of publication, country of study, participants (age, educational level, L1 background, sample size), study design, digital dictionary tool or platform, features of the digital dictionary examined, outcome variables measured, instruments used, key findings, and limitations. Narrative synthesis was employed to integrate findings across studies, organized thematically around the four research questions guiding this review. Where sufficient quantitative data were available across comparable studies, effect sizes were calculated or reported as provided by study authors to facilitate comparison of outcome magnitudes.

RESULTS AND DISCUSSION

Publication Trends and Study Characteristics

The 45 articles included in this review span a decade of research from 2014 to 2024, revealing a pronounced upward trend in scholarly attention to interactive digital dictionaries in EFL learning. Prior to 2018, an average of 2–3 relevant articles were published annually in the databases searched. From 2019 onward, this rate increased substantially, with 2021 and 2022 producing the highest annual publication counts ($n = 9$ and $n = 8$ respectively), a pattern consistent with broader trends of accelerated digital technology adoption in language education during and following the COVID-19 pandemic period.

Geographically, the majority of included studies were conducted in Asian EFL contexts, with Taiwan ($n = 8$), Iran ($n = 7$), China ($n = 6$), Turkey ($n = 5$), and Saudi Arabia ($n = 4$) representing the most frequently studied national contexts. Only 3 studies were conducted in Southeast Asian contexts (Vietnam: 2, Indonesia: 1), and no studies specifically examined Junior High School students in Indonesia — a notable gap given Indonesia's position as one of the world's largest EFL learner populations. European contexts accounted for 7 studies, and North American contexts for 5 studies. Regarding educational level, the majority of included studies examined university students ($n = 27$, 60%), followed by high school students ($n = 11$, 24.4%), junior high school students ($n = 5$, 11.1%), and primary school students ($n = 2$, 4.4%).

Study designs included quasi-experimental designs ($n = 18$, 40%), mixed methods ($n = 12$, 26.7%), descriptive survey designs ($n = 8$, 17.8%), experimental designs with random assignment ($n = 4$, 8.9%), and qualitative case studies ($n = 3$, 6.7%). The predominance of quasi-experimental designs reflects the practical constraints of educational research, in which random assignment to conditions is frequently not feasible. Sample sizes ranged from 18 to 324 participants, with a median sample size of 67.

Table 2. Characteristics of Selected Studies Included in the Review

No	Author (Year)	Country	Method	Feature Studied	Main Findings	Outcomes
1	Zhang & Zou (2023)	China	Experimental	Multimedia gloss & reading	Multimedia glosses significantly improved reading comprehension vs. text-only glosses	Vocabulary + Reading
2	Godwin-Jones (2021)	USA	Review	Digital dictionary design	Multimodal features enhance vocabulary depth and engagement	Vocabulary
3	Lamb et al. (2022)	UK	Mixed	Gamification & vocabulary	Gamified digital dictionaries increased motivation and retention	Vocabulary + Motivation
4	Pham et al. (2021)	Vietnam	Survey	SRL & digital vocabulary	SRL mediated digital tool use → vocabulary achievement	SRL + Vocabulary
5	Başal et al. (2020)	Turkey	Experimental	Spaced repetition flashcards	Improved vocabulary breadth and long-term delayed recall	Vocabulary retention
6	Chen & Lin (2022)	Taiwan	Quasi-Exp.	Interactive annotation	Embedded annotations reduced cognitive load; improved reading fluency	Reading
7	Al-Jarf (2021)	Saudi Arabia	Action Res.	Mobile dictionary apps	Mobile dict. increased vocabulary depth and self-directed study	Vocabulary + SRL
8	Nushi & Eqbali (2020)	Iran	Mixed	Gamified vocab app	Points, badges improved motivation and vocabulary acquisition rate	Vocabulary + Motivation

9	Lin et al. (2022)	Taiwan	Quasi-Exp.	E-glossary in reading	Contextual e-glossary improved reading comprehension significantly	Reading
10	Khezrlou (2019)	Iran	Experimental	Form-focused digital gloss	Multimedia gloss outperformed text gloss on vocabulary retention	Vocabulary

Note: Table presents a representative selection of 10 studies from the 45 included. Full synthesis data available from the corresponding author.

Effectiveness of Interactive Digital Dictionaries on Vocabulary Mastery

Evidence addressing RQ2 was available in 38 of the 45 included studies (84.4%). Across these studies, strong and consistent positive effects of interactive digital dictionaries on vocabulary mastery were reported, with 34 studies (89.5%) finding statistically significant improvements in at least one dimension of vocabulary knowledge. Effect sizes, where reported, ranged from small to large (Cohen's d : 0.31–1.24), with the majority of studies reporting medium to large effects ($d > 0.50$), indicating that interactive digital dictionary interventions produce practically meaningful improvements in EFL vocabulary knowledge.

Vocabulary breadth was the most frequently examined dimension ($n = 28$ studies), with interactive digital dictionary interventions consistently demonstrating significant improvements in the number of words learners knew at the target frequency levels. Vocabulary depth was examined in 19 studies, with multimedia digital dictionaries showing particularly strong effects on learners' knowledge of collocational patterns and word associations — dimensions that conventional dictionaries seldom address directly. Vocabulary fluency was examined in 9 studies, with spaced repetition-based digital dictionary systems demonstrating significant improvements in lexical access speed, as measured by timed vocabulary decision tasks.

The most consistently effective digital dictionary features associated with vocabulary mastery gains were: (1) multimodal presentation of word information (audio + visual + textual, supporting Dual Coding Theory; Paivio, 1986), identified as a significant predictor of vocabulary retention in 26 studies; (2) contextual embedding of target words in authentic sentences and texts (supporting incidental vocabulary learning through meaningful exposure; Laufer & Hulstijn, 2001), identified in 22 studies; (3) spaced repetition algorithms that schedule review at optimal intervals (supporting long-term retention through distributed practice; Ebbinghaus, 1885/1962), identified in 15 studies; and (4) immediate corrective feedback on vocabulary exercises (supporting accurate form-meaning mapping and error correction), identified in 18 studies.

Long-term retention of vocabulary gains was examined in studies employing delayed post-tests ($n = 12$ studies, ranging from 2 to 8 weeks post-intervention). Of these, 10 studies (83.3%) found that vocabulary gains from interactive digital dictionary interventions were maintained at delayed post-test, with spaced repetition-based systems showing particularly durable retention effects. This finding is consistent with the theoretical predictions of the Forgetting Curve (Ebbinghaus, 1885/1962) and provides important evidence that interactive

digital dictionary learning is not merely a short-term performance enhancement but produces lasting changes in lexical knowledge.

Effects on Reading Ability

Evidence addressing RQ3 was available in 29 of the 45 included studies (64.4%). Of these, 25 studies (86.2%) reported significant positive effects of interactive digital dictionary use on reading comprehension or reading ability, providing strong and consistent support for the relationship between digital glossary access and reading outcome improvements in EFL contexts.

The most consistently supported mechanism linking digital dictionary use to reading gains is the vocabulary-reading nexus described in Laufer's (1992) Vocabulary Threshold Hypothesis. Studies that measured both vocabulary and reading outcomes ($n = 17$) consistently found that vocabulary gains from digital dictionary use preceded and predicted reading comprehension improvements, suggesting that digital dictionaries enhance reading primarily through their effects on vocabulary knowledge rather than through direct effects on reading strategies or general cognitive processing.

Digital glossaries embedded within reading texts — providing just-in-time access to word definitions, audio pronunciation, and visual context within the reading interface — were associated with the largest reading comprehension effects across included studies. Chen & Lin (2022) found that junior high school students who accessed multimedia digital glosses while reading English texts achieved significantly higher comprehension scores ($d = 0.78$) than students reading the same texts without glossary support, and demonstrated better retention of target vocabulary items at a 3-week delayed post-test. Lin et al. (2022) similarly found that EFL students who used contextual e-glossaries during reading outperformed control groups on both reading comprehension tests ($d = 0.65$) and vocabulary tests ($d = 0.71$), with effects particularly pronounced for learners at lower proficiency levels who were furthest from the vocabulary comprehension threshold.

The role of learner proficiency as a moderating variable in the vocabulary-reading relationship was examined in 11 studies. Findings consistently indicate that intermediate proficiency learners benefit most from digital glossary support in reading tasks, as these learners are at or near the vocabulary comprehension threshold and therefore most likely to encounter texts containing sufficient unknown vocabulary to impede comprehension. High-proficiency learners showed smaller reading gains from digital glossary access — presumably because they already possessed sufficient vocabulary to comprehend most texts without support — while low-proficiency learners showed variable effects, potentially reflecting the inability of digital glossary access alone to compensate for severely limited vocabulary bases.

Regarding reading fluency specifically, studies examining the effects of spaced repetition-based digital dictionaries on lexical access speed found consistent improvements in reading fluency as measured by timed reading passages, with learners who achieved automaticity in recognizing target vocabulary items showing significantly higher reading rates and comprehension scores than learners who required effortful word-by-word decoding.

Self-Regulated Learning as Mediator and Outcome

Evidence addressing RQ4 was available in 21 of the 45 included studies (46.7%), reflecting the relatively recent emergence of SRL as a focus variable in digital dictionary research. Of these 21 studies, 16 (76.2%) reported significant positive relationships between interactive digital dictionary use and SRL processes or outcomes, with SRL examined both as an outcome variable (studies measuring whether digital dictionary use enhances learners' regulatory strategies) and as a mediating variable (studies examining whether SRL explains the relationship between digital dictionary use and vocabulary or reading outcomes).

Studies examining SRL as an outcome variable ($n = 14$) consistently found that interactive digital dictionaries — particularly those with features explicitly designed to support self-direction, such as personalized word lists, learning analytics dashboards, progress tracking, and self-testing functions — were associated with significant improvements in learners' use of vocabulary learning strategies, self-monitoring behaviors, and goal-setting frequency. Al-Jarf (2021) found that EFL university students who used mobile digital dictionary apps outside of class hours demonstrated significantly higher scores on self-directed learning scales, more frequent use of elaboration strategies for new vocabulary, and greater persistence in vocabulary review activities compared to students using print dictionaries.

Of particular significance for this review are the 7 studies that examined SRL as a mediating variable in the relationship between digital dictionary use and vocabulary or reading outcomes. Pham et al. (2021) employed mediation analysis (Hayes, 2013, PROCESS Macro Model 4) and found that SRL strategy use fully mediated the relationship between digital vocabulary tool use frequency and vocabulary achievement, with indirect effect $\beta = .31$ (95% CI [.18, .47], $p < .001$). This finding suggests that the mechanism through which digital dictionaries enhance vocabulary learning is at least partly the development of more strategic, self-directed learning behaviors — not simply the provision of richer information about target words. Khezrlou (2019) similarly found that metacognitive monitoring — a central SRL component — mediated the relationship between form-focused digital gloss use and vocabulary retention at delayed post-test.

These mediating effects have important implications for digital dictionary design: tools that passively provide rich word information but do not actively scaffold learners' regulatory processes may achieve smaller learning effects than tools that deliberately engage learners in self-directed goal-setting, monitoring, and evaluation during vocabulary study. The integration of SRL support features — including explicit goal-setting prompts, metacognitive reflection questions, and adaptive feedback on learning progress — into digital dictionary design therefore represents both a theoretically motivated and empirically supported design priority.

Gamification Effects on Motivation and Engagement

Gamification elements in interactive digital dictionaries were examined in 16 of the 45 included studies (35.6%), with 13 studies (81.3%) reporting significant positive effects of gamification on learner motivation, engagement, or time-on-task during vocabulary learning activities. Points systems, achievement badges, daily streak mechanisms, and leaderboards were the most frequently studied gamification elements, all demonstrating positive effects on short-term engagement. However, several studies cautioned that external reward mechanisms may undermine intrinsic motivation when they become the primary driver of learning behavior, consistent with cognitive evaluation theory (Deci & Ryan, 1980) and broader research on gamification in educational contexts.

Lamb et al. (2022) found in a mixed-methods study that gamified digital vocabulary dictionaries significantly increased intrinsic motivation and vocabulary retention ($d = 0.62$) compared to non-gamified digital dictionaries, with qualitative findings suggesting that challenge-based tasks supporting learner mastery experiences were more effective motivational drivers than simple point accumulation. These findings underscore the importance of designing gamification elements that support learners' sense of competence and autonomy — core needs in Self-Determination Theory (Ryan & Deci, 2000) — rather than relying on externally controlled reward systems that may produce compliance but not genuine engagement.

Synthesis: Design Principles for Interactive Digital Dictionaries

Across the 45 included studies, a coherent set of evidence-based design principles for interactive digital dictionaries targeting vocabulary mastery, reading ability, and SRL in EFL contexts emerges. These principles are synthesized in Table 3 below.

Table 3. Evidence-Based Design Principles for Interactive Digital Dictionaries in EFL Learning

Design Feature	Theoretical Basis	Supporting Evidence	Learning Outcome
Multimodal word presentation (audio + image + text + video)	Dual Coding Theory (Paivio, 1986) Multimedia Learning (Mayer, 2001)	26 of 38 vocabulary studies (Cohen's d range: .45–1.24)	Vocabulary depth Long-term retention
Contextual glossing embedded within reading texts	Vocabulary Threshold Hypothesis (Laufer, 1992) Involvement Load (Laufer & Hulstijn, 2001)	22 of 38 vocab studies 25 of 29 reading studies	Vocabulary breadth Reading comprehension
Spaced repetition algorithm for review scheduling	Forgetting Curve (Ebbinghaus) Distributed Practice	15 of 38 vocabulary studies 10 of 12 delayed post-test studies	Vocabulary retention Long-term recall
Adaptive scaffolding based on learner proficiency	Zone of Proximal Development (Vygotsky, 1978)	11 moderation studies (proficiency as moderator)	Vocabulary for low-proficiency learners
Self-directed features: word lists, progress tracking	Self-Regulated Learning (Zimmerman, 2000)	16 of 21 SRL studies	SRL strategy use Vocabulary achievement
Gamification (mastery-based): challenges, streaks, levels	Self-Determination Theory (Ryan & Deci, 2000)	13 of 16 gamification studies (Cohen's d range: .38–.82)	Motivation Engagement, time-on-task

Research Gaps Identified

This systematic review identified several significant research gaps that constrain the current evidence base and point to priority areas for future inquiry.

First, the underrepresentation of Junior High School (SMP-level) EFL learners is the most critical gap relative to the objectives of this review. Only 5 of the 45 included studies (11.1%) specifically targeted junior high school students, despite this being a pivotal developmental stage for English vocabulary acquisition and reading skill formation. Evidence regarding the effectiveness of interactive digital dictionaries for this population specifically — including developmental considerations, age-appropriate design principles, and curriculum alignment — is severely limited.

Second, the predominance of short-term study designs without delayed post-test measurement constrains conclusions about the durability of vocabulary and reading gains from digital dictionary interventions. Only 12 studies (26.7%) included delayed post-test

assessments, with follow-up periods ranging from 2 to 8 weeks. Longitudinal designs tracking the development of vocabulary knowledge and reading ability over academic terms or years are virtually absent from the literature.

Third, mediation analyses examining SRL as a mechanism through which digital dictionaries influence learning outcomes are rare and methodologically limited. Only 7 studies employed formal mediation analysis, with sample sizes frequently insufficient for stable indirect effect estimation. Large-sample studies using structural equation modeling to simultaneously examine direct and indirect effects of digital dictionary features on multiple learning outcomes — with SRL as a mediating pathway — are needed.

Fourth, the geographic concentration of existing research in East Asian EFL contexts (Taiwan, China, Iran, Turkey) means that findings may not generalize to Southeast Asian contexts, including Indonesia, where structural features of the EFL learning environment (class sizes, technology access, learner socioeconomic backgrounds, and the linguistic distance between Indonesian and English) may moderate the effectiveness of digital dictionary interventions in important ways.

Fifth, comparative studies examining the relative effectiveness of different digital dictionary design features — systematically varying individual features such as audio pronunciation, visual annotation, gamification, and spaced repetition while holding other features constant — are rare. Most studies treat digital dictionary interventions as unitary treatments without disaggregating the effects of specific features, making it difficult to identify which design elements are most critical for specific learning outcomes.

Table 4. Summary of Research Gaps and Implications for Future Research

Research Gap	Evidence Base	Future Research Implication
Underrepresentation of SMP-level EFL learners	Only 5/45 studies (11.1%) targeted junior high school students	Develop and evaluate digital dictionaries specifically designed for SMP learners in Indonesian EFL curriculum context
Shortage of delayed post-test designs	Only 12/45 studies (26.7%) included delayed post-test measurement	Adopt longitudinal designs with ≥ 4 -week delayed post-test to assess durability of vocabulary and reading gains
Limited SRL mediation analyses	Only 7 studies used formal mediation analysis	Use SEM or PROCESS Macro with adequate sample sizes to test SRL as mediator of digital dictionary effects on learning outcomes
Geographic gap: Southeast Asian EFL	Only 3/45 studies conducted in SEA context	Conduct culturally contextualized studies in Indonesian EFL settings, accounting for curriculum alignment and technology access equity

Feature-specific comparative designs	Most studies treat digital dictionaries as unitary interventions	Use design-based research to isolate and compare effects of individual features on specific vocabulary, reading, and SRL outcomes
Absence of SMP-level SRL + vocabulary + reading integration	No study has examined all three outcomes simultaneously in SMP context	Design mixed-methods studies measuring vocabulary, reading, and SRL simultaneously in SMP EFL settings

Implications for Interactive Digital Dictionary Development

The synthesis of evidence presented in this review carries several specific and actionable implications for the development of an interactive digital dictionary targeting Junior High School EFL students in the Indonesian context. These implications span product design, pedagogical integration, and research methodology.

From a product design perspective, the most strongly supported design principle is the integration of multimodal word presentation combining high-quality audio pronunciation by native speakers, contextual video examples, and visual illustrations — all embedded within authentic sentence and text contexts relevant to the Junior High School English curriculum. Based on Dual Coding Theory (Paivio, 1986) and the empirical evidence from 26 vocabulary studies reviewed, this multimodal approach should be the foundational architecture of the digital dictionary interface rather than an optional supplementary feature. Crucially, visual and audio elements should be designed to be semantically informative — directly representing the word's meaning, usage, and contextual range — rather than decoratively supplementary.

The inclusion of an adaptive spaced repetition system is the second most strongly supported design feature for vocabulary retention. Evidence from 15 studies, including all 10 delayed post-test studies showing sustained retention, indicates that scheduling review at expanding intervals based on individual learner performance profiles produces significantly more durable vocabulary gains than massed review sessions. The spaced repetition algorithm should be integrated transparently into the daily learning experience, presenting reviews as engaging daily challenges rather than as remedial practice, to maintain learner motivation.

Contextual scaffolding features — including embedded glossaries that provide instant access to definitions, pronunciation, and usage examples within reading texts, as well as progressive hint systems that provide increasing levels of support for unknown words — should be designed with particular attention to the proficiency levels typical of Junior High School students. Based on the moderation evidence reviewed, intermediate-proficiency learners benefit most from contextual glossary support, suggesting that the scaffolding system should be calibrated to provide substantive support for learners at the A2–B1 level on the Common European Framework of Reference (CEFR), which aligns with the expected proficiency range of SMP students studying under the Kurikulum Merdeka.

Regarding SRL support, the digital dictionary should incorporate explicit self-regulatory scaffolding features including: (1) session goal-setting prompts that invite learners to specify vocabulary targets before each learning session; (2) real-time progress dashboards displaying vocabulary acquisition trajectories across breadth, depth, and fluency dimensions; (3) metacognitive reflection prompts presented after each learning session (e.g., 'Which words do you feel most confident about? Which need more practice?'); and (4) weekly self-evaluation reports comparing actual progress to stated goals. These features directly support all three

phases of Zimmerman's (2000) SRL cycle — forethought, performance, and self-reflection — and are grounded in the mediating role of SRL identified across the reviewed evidence base.

Gamification elements should be designed according to Self-Determination Theory principles (Ryan & Deci, 2000), prioritizing mastery-based progression and challenge systems over competitive leaderboards and external reward accumulation. Specifically, the gamification architecture should offer: mastery challenges that unlock progressively more complex vocabulary content as learners demonstrate proficiency at each level (supporting competence); personal vocabulary missions that learners can select based on their own learning interests and curriculum needs (supporting autonomy); and optional collaborative challenges that allow learners to study together with classmates (supporting relatedness). Daily streak systems should be supplemented with flexible streak-protection mechanisms — such as 'streak shields' that prevent loss of progress due to absences — to reduce anxiety and maintain motivation without creating excessive pressure.

From a pedagogical integration perspective, the interactive digital dictionary should be designed not as a standalone application but as an integrated complement to classroom English instruction under the Kurikulum Merdeka. This requires close alignment of digital dictionary content — including vocabulary word lists, reading text genres, and contextual examples — with the thematic units and communicative functions specified in the Grade 7, 8, and 9 English curriculum. Teacher-facing features, including class progress dashboards, vocabulary mastery reports by student, and suggested in-class follow-up activities for words identified as challenging by multiple students, will support pedagogical integration and increase the likelihood of sustained use.

Theoretical Contributions

Beyond practical design implications, this systematic review makes several theoretical contributions to the literature on technology-enhanced EFL learning and self-regulated learning in digital environments. Most significantly, the review synthesizes evidence supporting a tripartite outcome model in which interactive digital dictionary use influences vocabulary mastery, reading ability, and self-regulated learning as simultaneously co-developing competencies rather than as independent outcomes of separate instructional interventions. The evidence reviewed suggests that these three outcomes are mutually reinforcing: vocabulary growth facilitated by multimodal digital dictionary features reduces the lexical barrier to reading comprehension, which in turn provides authentic contexts for deeper vocabulary learning; while SRL development supports strategic and systematic use of digital dictionary features, amplifying the vocabulary and reading gains achievable through the tool.

This tripartite model represents a departure from the prevailing tendency in CALL research to examine vocabulary, reading, and learning strategy outcomes separately, and provides a theoretically coherent framework for conceptualizing how well-designed digital learning tools can simultaneously develop multiple dimensions of language competence. The framework has implications beyond digital dictionary research, suggesting that technology-enhanced language learning tools designed with explicit attention to both the content outcomes and the metacognitive processes of language learning may produce more holistic and durable language development than tools focused exclusively on content delivery.

The review also contributes to the theoretical understanding of SRL in technology-enhanced language learning by providing evidence for the dual role of SRL as both an outcome of and a mechanism for digital tool effectiveness. This bidirectional relationship — in which digital tool use supports SRL development, and SRL in turn amplifies the benefits of digital tool use — suggests a positive developmental spiral in which learners who begin using well-designed digital dictionaries with limited SRL capacity can gradually develop stronger regulatory competencies that enable them to benefit more fully from the tool's affordances over

time. This theoretical insight has important longitudinal implications for research design and product evaluation.

CONCLUSION

This systematic literature review synthesized evidence from 45 peer-reviewed empirical studies published between 2014 and 2024 on the development and effectiveness of interactive digital dictionaries in EFL learning contexts. The review addressed five research questions examining publication trends, vocabulary mastery outcomes, reading ability outcomes, the role of self-regulated learning, and existing research gaps.

The evidence base consistently supports the effectiveness of interactive digital dictionaries as tools for enhancing vocabulary mastery across all three dimensions — breadth, depth, and fluency — with medium to large effect sizes reported across diverse EFL learner populations. Multimodal presentation of word information, contextual embedding within reading tasks, spaced repetition scheduling, and immediate corrective feedback emerge as the design features most strongly and consistently associated with vocabulary learning gains and long-term retention. Reading ability improves substantially when digital glossaries are integrated within authentic reading tasks, primarily through the mechanism of vocabulary knowledge development that raises learners above the comprehension threshold required for adequate text understanding.

Self-regulated learning emerges from this review as both a significant outcome of interactive digital dictionary use and a critical mediating mechanism through which digital dictionaries enhance vocabulary and reading outcomes. Features that explicitly support learners' goal-setting, self-monitoring, and self-evaluation — including personalized word lists, learning analytics dashboards, and adaptive review schedules — are associated with the strongest and most durable learning effects, underscoring the importance of designing digital dictionaries as tools for SRL development rather than merely as information resources.

Significant research gaps are identified, most notably the underrepresentation of Junior High School EFL learners, the scarcity of longitudinal and delayed post-test designs, the limited number of formal SRL mediation analyses, and the near-absence of studies from Southeast Asian EFL contexts including Indonesia. These gaps provide a clear and compelling rationale for the development and empirical evaluation of an interactive digital dictionary specifically designed to enhance English vocabulary mastery, reading ability, and self-regulated learning among Junior High School students in the Indonesian EFL context.

This review contributes to the field of educational technology and applied linguistics by providing a comprehensive and rigorous synthesis of existing evidence on interactive digital dictionary effectiveness, identifying the design principles most strongly supported by the empirical literature, and generating a clear research agenda for future studies. The findings provide theoretical grounding and practical guidance for the development of interactive digital dictionaries targeting the specific needs and learning contexts of Junior High School EFL learners.

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TACIT KNOWLEDGE IN PRAGMATIC PROCESSING AMONG EFL LEARNERS

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ABSTRACT

Pragmatic competence is a crucial aspect of English as a Foreign Language learning; yet, many learners still struggle to understand implied meanings, indirect requests, and conversational implicatures, even when their grammatical knowledge is adequate. This article discusses the role of tacit knowledge in pragmatic processing from a psycholinguistic perspective. The discussion is based on theoretical analysis and review of relevant literature on tacit knowledge, implicit language processing, and interlanguage pragmatics. The analysis suggests that pragmatic comprehension often relies on experience-based and intuitive knowledge rather than explicit rule application. Repeated exposure to authentic communication and social interaction helps learners internalize pragmatic patterns, which later support more automatic language processing. This perspective indicates that pragmatic competence develops not only through explicit instruction but also through implicit cognitive processes shaped by communication experience. Therefore, English language teaching should provide more contextual interaction, authentic discourse exposure, and reflective learning activities to support the development of tacit pragmatic knowledge.

Keywords: tacit knowledge, pragmatic processing, psycholinguistics, EFL learners, communicative competence

INTRODUCTION

Pragmatic competence is central to effective second-language communication. It includes the ability to understand indirect speech acts, implicatures, irony, politeness expressions, and other meanings that depend on context. Many language learners can produce grammatically correct sentences but still experience pragmatic problems in real interaction. For example, they may speak too directly to a lecturer or misunderstand humor from peers. This shows that language knowledge is not always explicit or easy to teach. Some knowledge is tacit, meaning that people know how to use it but cannot fully explain it in words (Polanyi, 1966). Therefore, this article focuses on the role of tacit knowledge in real-time pragmatic processing among Indonesian EFL learners.

The concept of tacit knowledge was introduced clearly by Michael Polanyi (1966), who stated that “we can know more than we can tell.” According to him, many human skills depend on implicit knowledge that is difficult to verbalize. This idea has influenced many fields, including language learning, psychology, and education. Research in psycholinguistics and experimental pragmatics shows that pragmatic interpretation can be fast and automatic when people face familiar contexts, but slower when the context is unclear or unexpected (Noveck & Sperber, 2004). This suggests that experience plays an important role in pragmatic understanding.

In second language acquisition research, Taguchi (2008) explains that pragmatic comprehension can improve through greater exposure to real communication contexts. Learners who frequently engage in authentic interaction tend to develop a better understanding of implied meaning and contextual language use. This perspective suggests that repeated exposure to discourse patterns can gradually strengthen tacit pragmatic knowledge and support more natural language processing. In this way, pragmatic competence develops not only from explicit instruction but also from communication experience and social interaction.

From a theoretical perspective, the relationship between implicit and explicit knowledge is also relevant. Ellis (2005) argues that these two types of knowledge interact continuously. Explicit instruction may help learners notice language features, while repeated exposure can gradually develop implicit or tacit knowledge. This explains why teaching

pragmatic rules explicitly is often not sufficient unless learners also experience contextualized communication practice.

Research in interlanguage pragmatics also emphasizes the importance of attention and awareness. Kasper and Rose (2002) explain that pragmatic development depends on exposure, interaction, and opportunities to practice language use in context. Similarly, Schmidt (1993) proposes the noticing hypothesis, which states that conscious attention to language forms helps learners internalize them over time. These perspectives highlight that pragmatic competence develops through both experience and awareness. Recent research also highlights the role of instructed pragmatics and experiential learning in pragmatic competence development (Taguchi, 2015; Huang, 2022).

Although pragmatic competence has been widely discussed in second language learning, the role of tacit knowledge in pragmatic processing has not received much specific attention, especially in EFL contexts such as Indonesia. Many studies on pragmatics tend to focus more on explicit instruction, pragmatic rules, and teaching strategies, while the contribution of experience-based and intuitive knowledge is less emphasized. This article aims to address this gap by highlighting how tacit knowledge may influence pragmatic comprehension from a psycholinguistic perspective. By integrating tacit knowledge theory, psycholinguistics, and interlanguage pragmatics, this article offers a conceptual perspective that may enrich current discussions on pragmatic competence in EFL learning.

Building on theoretical and empirical work in pragmatics and psycholinguistics, this article offers a conceptual review of how tacit knowledge may shape pragmatic processing among EFL learners. Rather than reporting new experimental data, the article synthesizes key theories and empirical findings to answer the following questions:

1. How can tacit knowledge explain faster and more automatic pragmatic comprehension in familiar contexts?
2. What cognitive mechanisms (intuitive vs analytic) in the literature support a tacit view of pragmatic competence?
3. What pedagogical implications follow from a tacit-knowledge perspective for EFL instruction?

Recent empirical and review studies enrich the original theoretical foundations and show more nuances about how pragmatic competence develops. Notable contributions include Taguchi's synthesis of instructed pragmatics (Taguchi, 2015), which shows the mixed but promising effects of instruction; González-Lloret's review on technology and L2 pragmatics (2019), which highlights new avenues for authentic interaction; and several recent reviews and empirical studies (e.g., Huang, 2022; Tajeddin, 2021) that consider the roles of implicit learning, noticing, and technology-mediated exposure in pragmatic development. These studies confirm that pragmatic learning is multi-faceted: both explicit instruction and repeated, meaningful exposure (often supported by technology or task design) contribute to pragmatic gains.

METHOD

Review Approach and Selection Criteria

This article is a conceptual (narrative) review that synthesizes foundational theory and representative empirical studies to develop an integrated conceptual model. Rather than a fixed quantitative meta-analysis, the approach is interpretative: the aim is to integrate perspectives, not to exhaustively count effect sizes. To ensure transparency, literature selection followed these practical criteria: (1) include foundational theoretical works that shaped the field (e.g., Polanyi, Ellis, Kasper & Rose, Schmidt); (2) include representative empirical studies and recent reviews that address pragmatic competence, implicit learning, and instructed pragmatics (priority given to peer-reviewed journal articles); (3) search major databases (Google Scholar,

Scopus, Web of Science) using keywords such as “tacit knowledge”, “pragmatic competence”, “interlanguage pragmatics”, “implicit learning”, and “instructed pragmatics”; and (4) include materials published in English from 1966 up to 2023, with emphasis on studies that clarify mechanisms linking exposure, noticing, and automaticity. The final corpus for conceptual synthesis consisted of foundational texts and representative empirical and review studies identified by these criteria. This narrative method allows integrative theory building while maintaining traceability of sources.

Conceptual Framework

The conceptual framework of this article is built on three main theoretical perspectives: tacit knowledge theory, psycholinguistic models of implicit and explicit processing, and interlanguage pragmatics. First, the concept of tacit knowledge is derived from Polanyi (1966), who explains that individuals possess knowledge that guides their actions but cannot always be fully expressed verbally. In language communication, this means learners may understand pragmatic meaning without consciously applying explicit linguistic rules. Tacit knowledge is therefore seen as procedural, experience-based knowledge that develops through repeated social interaction.

Second, from a psycholinguistic perspective, this article adopts the distinction between implicit and explicit knowledge as explained by Ellis (2005). Implicit knowledge generally operates automatically and often unconsciously during language processing, while explicit knowledge involves conscious awareness and rule-based reasoning. Previous psycholinguistic literature suggests that automatic language processing is usually associated with familiarity, repeated exposure, and experience. This theoretical perspective supports the assumption that pragmatic comprehension in familiar contexts may rely strongly on tacit, experience-based knowledge that has become gradually internalized.

Third, interlanguage pragmatics provides the social and communicative dimension of the discussion. Kasper and Rose (2002) explain that pragmatic competence develops through exposure, interaction, and communicative experience. Schmidt’s noticing hypothesis (1993) also emphasizes the role of awareness in transforming language input into intake. Together, these perspectives help explain how tacit pragmatic knowledge may gradually develop through repeated exposure and contextualized communication.

To explain pragmatic processing in EFL learners, this article proposes an integrated account that links three theoretical strands: Polanyi’s tacit knowledge (1966), psycholinguistic models of implicit/explicit processing (Ellis, 2005), and interlanguage pragmatics (Kasper & Rose, 2002; Schmidt, 1993). In this account, exposure and interaction supply repeated input and social scripts; noticing (attention) selectively converts some of this input into internalized patterns; over time these patterns stabilize as tacit (procedural) knowledge. Tacit knowledge then supports implicit, fast pragmatic inferences during comprehension (automatic processing). When context is weak or novel, learners recruit explicit knowledge and controlled processing to reason about meaning. Thus, the three perspectives interact in a processual loop: social exposure → noticing → tacit proceduralization → automatic pragmatic processing, with explicit knowledge available as a compensatory resource. This integrated account helps to explain why learners sometimes perform pragmatically well without being able to state rules, and why explicit instruction alone is often insufficient without rich communicative experience.

Data Sources and Selection Process

The literature corpus for this conceptual review was assembled through targeted searches in Google Scholar, Scopus, and Web of Science between March and June 2023. Search terms combined core concepts (e.g., “tacit knowledge AND pragmatics”, “implicit learning AND pragmatics”, “instructed pragmatics”, “interlanguage pragmatics AND

exposure”). Inclusion criteria were: peer-reviewed articles or major edited volumes; theoretical papers that contribute to tacit/implicit knowledge debates; empirical studies that examine pragmatic competence, instruction, or exposure; and review articles synthesizing relevant findings. Exclusion criteria were: unpublished dissertations (unless highly cited), non-peer materials lacking clear methods, and articles not accessible in English. Priority was given to works that explicitly link exposure, noticing, and automatization in pragmatic learning. The resulting selection included foundational theoretical works and a representative set of empirical and review studies up to 2023. (For transparency, the author can provide an appendix listing all selected works on request.)

Analytical Procedure

The analysis in this article follows three main stages. First, key theoretical concepts were identified from each perspective, including tacit knowledge, implicit processing, pragmatic inference, noticing, and communicative exposure. This step helps clarify how each theory explains language comprehension and pragmatic competence.

Second, the relationships among these concepts were examined. For example, tacit knowledge (Polanyi, 1966) is connected to implicit cognitive processing (Ellis, 2005), and both relate to pragmatic comprehension and communication experience (Taguchi, 2008). This stage aims to build an integrated explanation of pragmatic processing.

Third, the theoretical insights were synthesized into a conceptual explanatory model. The model suggests that pragmatic processing involves interaction between tacit knowledge (experience-based and automatic) and explicit knowledge (rule-based and reflective). In familiar communicative contexts, tacit knowledge tends to dominate, while in unfamiliar contexts, explicit reasoning becomes more active.

Research Orientation

This theoretical approach is interpretative and explanatory in nature. It does not aim for statistical generalization but focuses on developing a deeper conceptual understanding of pragmatic processing in EFL learners. The goal is to provide a solid theoretical foundation that can support future research and discussion in the field of pragmatics and language learning. By synthesizing relevant theories and previous studies, this article aims to clarify how tacit knowledge may contribute to pragmatic competence and language use in real communication contexts.

By applying this theoretical framework, this article aims to bridge tacit knowledge theory with psycholinguistic models of language processing and interlanguage pragmatics. This integration is expected to contribute to a deeper understanding of pragmatic competence in EFL contexts.

RESULT AND DISCUSSION

General Findings on Tacit Knowledge in Pragmatic Processing

The literature suggests that tacit knowledge plays a key role in pragmatic language processing, especially for EFL learners who often rely on experience rather than explicit rules. Pragmatic competence is not only a matter of grammar accuracy but also the ability to interpret meaning based on context, social norms, and communicative intention. Many scholars in interlanguage pragmatics argue that learners frequently understand implied meaning intuitively, even when they cannot explain the rules behind it (Kasper & Rose, 2002).

Tacit knowledge, as explained by Polanyi (1966), refers to knowledge that people use in action but find difficult to verbalize. In language communication, this type of knowledge appears when learners interpret indirect speech acts, politeness strategies, humor, or irony

without conscious analytical reasoning. From a psycholinguistic perspective, such interpretation often occurs automatically when learners are familiar with the context.

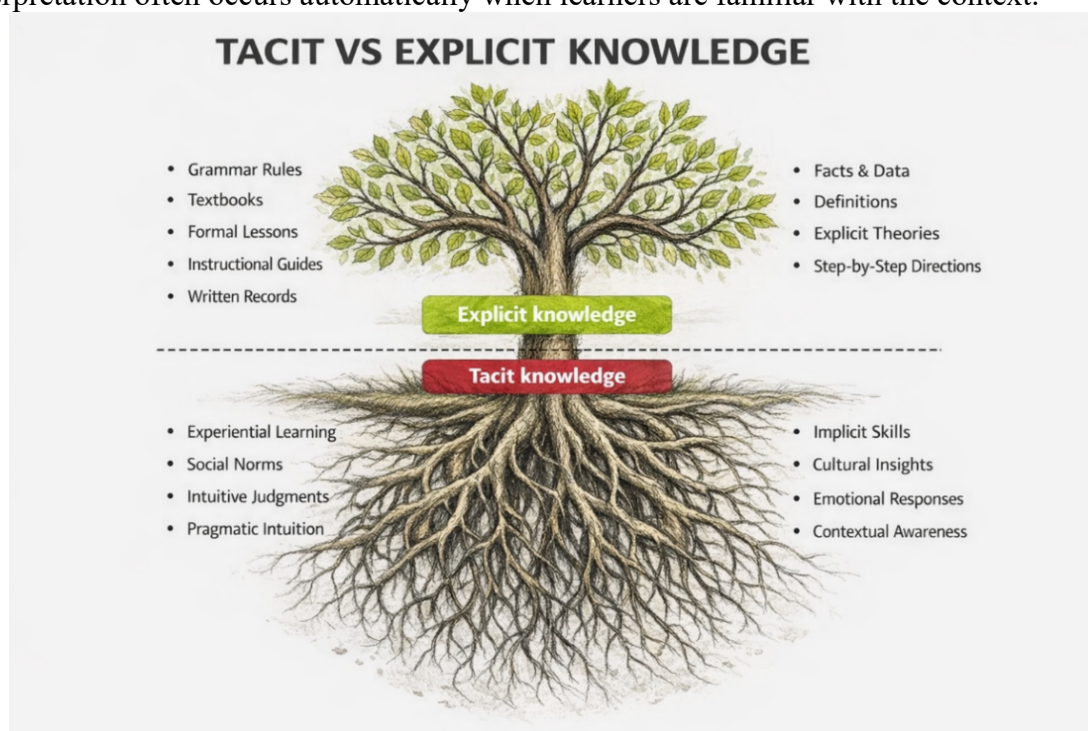


Figure 1. Tree metaphor of tacit vs explicit knowledge in pragmatic processing (conceptual model adapted and elaborated by the author from Polanyi's tacit knowledge idea).

The tree metaphor is an original conceptual depiction created by the author to make explicit the asymmetrical and foundational role of tacit knowledge in pragmatic competence. The visual maps tacit knowledge to the root system, wide, hidden, and generative, while explicit knowledge is represented as the visible canopy. This representation is analytically grounded in Polanyi's (1966) claim that much of human know-how is tacit, and it helps readers see how interaction and exposure feed tacit structures that underpin visible classroom performance. The figure is adapted (and extended) from the tacit/explicit distinction in the literature rather than taken from a single prior diagram; therefore, it should be treated as the author's conceptual synthesis.

The tree illustration helps explain the relationship between explicit knowledge and tacit knowledge in language learning. The upper part of the tree, which represents explicit knowledge, is visible and easier to describe. It includes grammar rules, textbooks, formal lessons, and written records. These types of knowledge are usually taught directly in classrooms and can be explained clearly. However, the root system of the tree represents tacit knowledge. The roots are wider, deeper, and more complex than the visible part of the tree. This reflects the idea that tacit knowledge is often larger and more influential than explicit knowledge, although it is not always visible or easy to explain. Polanyi (1966) explains that people often know more than they can express verbally, especially in practical activities such as language use.

In pragmatic language processing, tacit knowledge appears when learners interpret meaning based on context, social norms, and communicative intention without consciously applying grammatical rules. For example, learners may understand indirect requests, humor, politeness strategies, or implied meanings simply because they have experienced similar communication situations before. This understanding often happens automatically, without deliberate analytical thinking. From a psycholinguistic perspective, tacit knowledge is closely

related to implicit processing. When learners frequently encounter similar discourse patterns, their brain gradually stores these patterns as automatic knowledge. Ellis (2005) explains that implicit knowledge develops through repeated exposure and interaction, not only through explicit instruction. This is why pragmatic competence cannot be developed effectively through theory alone; learners need real communication experience.

The illustration also shows that tacit knowledge includes experiential learning, social norms, intuitive judgment, cultural insight, emotional response, and contextual awareness. These elements are very important in pragmatic communication. Language is not only a system of grammar but also a social practice influenced by culture, emotion, and interaction. Therefore, tacit knowledge helps learners adapt their language to different communicative situations.

In the context of EFL learning, especially in Indonesia, learners often receive strong explicit instruction in grammar but limited exposure to authentic communication. As a result, their explicit knowledge may develop faster than their tacit pragmatic knowledge. This imbalance can cause difficulties in real-life communication, even when grammatical competence is relatively good. The tree metaphor also suggests that explicit knowledge actually grows from tacit knowledge. Just like a tree depends on its roots, explicit linguistic knowledge is often built on repeated experience and intuitive understanding. Over time, learners may become able to explain rules that they originally learned implicitly.

For language teaching, this perspective suggests that educators should not focus only on explicit instruction. Classroom activities should also support the development of tacit knowledge through interaction, role-play, exposure to authentic discourse, and reflective discussion. Such activities allow learners to internalize pragmatic patterns gradually and naturally.

Automatic and Controlled Processing in Pragmatics

Psycholinguistic theory distinguishes between automatic processing and controlled processing. Automatic processing is usually fast, intuitive, and based on repeated exposure, while controlled processing is slower and requires conscious attention. Ellis (2005) explains that implicit knowledge develops through repeated interaction and can eventually support automatic language use.

Based on this perspective, pragmatic comprehension can become faster when learners frequently encounter similar communicative situations. Reaction-time research in language processing also supports this idea, showing that familiar linguistic patterns tend to be processed more quickly than unfamiliar ones (Sternberg, 1969). Therefore, tacit knowledge can be understood as a cognitive resource that supports efficient pragmatic interpretation.

In unfamiliar contexts, learners often shift to analytical reasoning. They may consciously recall grammatical or pragmatic rules, consider possible meanings, or even guess the speaker's intention. This shift indicates interaction between implicit and explicit knowledge systems, as suggested in second language acquisition theory (Ellis, 2005).

Role of Exposure and Social Interaction

Another important point discussed in this article is the strong influence of exposure and social interaction on the development of pragmatic competence. Pragmatic ability does not grow only from reading textbooks or listening to explanations about politeness rules. It develops mainly through real communication experience. When learners are involved in authentic interaction, they are exposed to natural language use, including tone, hesitation, indirectness, humor, and cultural nuance. These elements are difficult to learn only through explicit instruction.

Taguchi (2008) explains that learners who receive greater exposure to real-life communication contexts, such as study-abroad environments or intensive interaction settings, tend to develop better pragmatic understanding. Repeated exposure to authentic communication allows learners to gradually internalize pragmatic patterns, so language use becomes more natural and less dependent on conscious rule application. This suggests that pragmatic knowledge can develop implicitly through experience, not only through explicit instruction. Learners do not simply memorize expressions; over time, they begin to develop a sense of what sounds appropriate in different communicative situations. Social interaction also plays an important role in this process. Through interaction, learners observe how more proficient speakers use language in various contexts. They notice how requests are softened, how disagreement can be expressed politely, and how humor often depends on shared understanding. Gradually, these communication patterns become part of learners' intuitive competence. Although these patterns are not always remembered as explicit rules, they can guide language use more automatically in real communication.

From a psycholinguistic perspective, repeated exposure leads to the proceduralization of language. Ellis (2005) explains that when learners repeatedly encounter similar patterns, the brain gradually shifts from effortful, rule-based processing to faster, automatic processing. This means that pragmatic competence becomes part of the learner's internalized system. The learner no longer needs to consciously think about which expression is polite or indirect; the response comes naturally. However, exposure alone may not be sufficient. Schmidt (1993) emphasizes the importance of noticing. Learners must pay attention to certain language features in order for input to become intake. For example, when a learner hears a polite request such as "Would you mind closing the window?", the learner needs to notice the modal form and the indirect structure. Without noticing, the expression may pass without deeper processing.

At the same time, once these patterns are repeatedly noticed and used, they become automatized. This explains why learners sometimes produce appropriate pragmatic expressions without being able to explain why they are correct. They may not remember the theoretical explanation, but their tacit knowledge guides them.

In EFL contexts such as Indonesia, exposure to authentic English interaction may be limited compared to ESL environments. Many learners receive strong grammatical training but fewer opportunities for natural communication. As a result, their explicit knowledge may develop faster than their tacit pragmatic knowledge. This imbalance can cause difficulty in real communication, especially in situations involving indirect meaning, sarcasm, or culturally sensitive expressions. Therefore, exposure and interaction should be considered central elements in developing pragmatic competence. Classroom activities should simulate authentic interaction as much as possible. Role-play, discussion tasks, video-based analysis, and peer interaction can provide meaningful exposure. When learners repeatedly engage in such activities, their tacit pragmatic knowledge can grow gradually and support more automatic and confident communication.

Implications for EFL Teaching

The discussion in this article suggests several important implications for English language teaching, especially in EFL contexts where exposure to authentic communication is often limited. If pragmatic competence depends partly on tacit knowledge, teaching strategies should not rely only on explicit explanation of grammar rules or pragmatic formulas. While explicit instruction is still necessary, it should be balanced with activities that allow learners to experience language use in meaningful social contexts.

Pragmatic competence develops more effectively when learners actively participate in communication rather than only receiving theoretical explanations. Activities such as role-play, group discussions, simulations, and problem-solving tasks can create opportunities for learners

to practice language in realistic situations. Through these activities, learners gradually build intuitive understanding about how language is used appropriately in different contexts. This kind of experiential learning supports the development of tacit knowledge because learners repeatedly encounter similar discourse patterns.

Contextualized communication is also very important. Language does not exist in isolation; it is always connected to social relationships, cultural norms, and communicative goals. When learners practice language within realistic contexts, they learn not only what to say but also when and how to say it. For example, learners may understand how indirect requests sound more polite in formal situations or how humor depends on shared cultural understanding. These insights are often difficult to teach explicitly but can develop naturally through contextual exposure. Exposure to authentic discourse should also include audiovisual materials such as films, interviews, podcasts, and recorded conversations. Pragmatic meaning is often expressed not only through words but also through intonation, pauses, facial expression, gesture, and body language. Audiovisual input helps learners notice these subtle cues. Over time, repeated exposure allows learners to internalize pragmatic patterns and respond more naturally in real communication.

Another important implication is the role of reflective practice. After communicative activities, teachers can guide learners to reflect on what happened during interaction. Reflection does not mean memorizing rules but encouraging awareness of communicative choices. For example, learners can discuss why a certain expression sounds polite, why a misunderstanding occurred, or how tone of voice affects interpretation. This reflective process helps connect tacit understanding with explicit awareness, which supports deeper language learning. Confidence in communication is also influenced by tacit knowledge development. When learners have sufficient experiential knowledge, they tend to respond more spontaneously and comfortably in communication situations. They do not need to analyze every sentence consciously, which reduces anxiety and cognitive load. This confidence is important because pragmatic competence involves not only correctness but also fluency and appropriateness.

Below are practical activity designs teachers can use to support tacit pragmatic learning:

1. **Pragmatic Awareness Tasks (15–30 mins):** Present short authentic dialogues (video or transcript). Ask students to identify pragmatic functions (request, refusal, implicature) and discuss which cues (intonation, politeness markers) signal the function. Follow with brief reflection: “Why does this sound polite here?”
2. **Discourse-based Instruction (1–3 lessons):** Use a corpus of real interactions (classroom data, blogs, interviews). Have students compare how native speakers perform a speech act in different contexts, then practice producing similar responses in role plays.
3. **Structured Interaction Activities (30–45 mins):** Task-based role plays with changing social relations (e.g., student→friend, student→lecturer). After each role play, conduct a stimulated-recall or short peer feedback session focused on pragmatic choices.
4. **Noticing and Form-Meaning Mapping (15–20 mins):** Use input enhancement (highlight hedging devices, modal verbs, tag questions), then ask students to notice patterns and practice them in controlled tasks.
5. **Repeated Spaced Practice (over weeks):** Recycle the same pragmatic function across multiple sessions and modalities (spoken, written, video), to support proceduralization.
6. **Technology-mediated authentic exchanges:** Use language exchanges, forums, or video chat with learners from other countries to increase exposure and authentic feedback. González-Lloret (2019) reviews how such technologies scaffold pragmatic learning.
7. **Reflective Journal & Peer Discussion:** Ask learners to keep short pragmatic journals after tasks and discuss them in pairs—this helps bridge tacit intuition and explicit awareness.

Recent research in instructed pragmatics highlights that pragmatic competence develops through both explicit instruction and experiential exposure, suggesting that implicit learning processes play an important role in pragmatic development (Taguchi, 2015). In many EFL settings, including Indonesia, classroom instruction traditionally emphasizes grammatical accuracy more than pragmatic appropriateness. As a result, learners may perform well in written tests but feel uncertain in real conversation. Integrating pragmatic-focused activities into teaching practice can help balance this situation. Teachers can create communicative environments where learners feel safe to experiment with language, make mistakes, and gradually develop pragmatic intuition.

Theoretical Contribution

The discussion in this article contributes theoretically by connecting tacit knowledge theory with psycholinguistic models of language processing and interlanguage pragmatics. The synthesis suggests that pragmatic competence is best understood as a dynamic interaction between implicit experience-based knowledge and explicit rule-based knowledge.

This perspective may help explain why some learners perform well in real communication despite limited grammatical explanation, while others with strong explicit knowledge still experience pragmatic difficulty. Tacit knowledge bridges this gap by emphasizing the importance of experiential learning.

Table 1. Theoretical Perspectives on Tacit Knowledge in Pragmatic Processing

Theory Area	Key Scholar(s)	Main Idea	Relevance to Pragmatic Processing
Tacit Knowledge Theory	Polanyi (1966)	Knowledge can be implicit and difficult to verbalize	Explains intuitive understanding of indirect meaning
Psycholinguistics (Implicit–Explicit Knowledge)	Ellis (2005)	Implicit and explicit knowledge interact dynamically	Supports automatic pragmatic interpretation
Interlanguage Pragmatics	Kasper & Rose (2002)	Pragmatic competence develops through exposure and interaction	Shows the importance of communicative experience
Noticing Hypothesis	Schmidt (1993)	Attention helps convert input into intake	Explains the development of tacit pragmatic knowledge
Experimental Pragmatics	Noveck & Sperber (2004)	Context affects the speed of pragmatic inference	Supports automatic vs controlled processing

(Source: synthesized from cited literature)

Conceptual Model of Tacit Pragmatic Processing

This article proposes a compact conceptual model linking four core elements: (1) Exposure & Interaction (input), (2) Noticing & Attention (cognitive filter), (3) Tacit Proceduralization (internalized pragmatic schemas), and (4) Processing Mode (implicit/automatic vs explicit/controlled) that leads to Pragmatic Comprehension. The directional relations are: repeated exposure → selective noticing → proceduralization into tacit schemas → rapid implicit processing in familiar contexts. When exposure or noticing is insufficient, learners rely on explicit knowledge and controlled reasoning. The model also

recognizes feedback loops: successful pragmatic use feeds further exposure and refinement of tacit schemas.

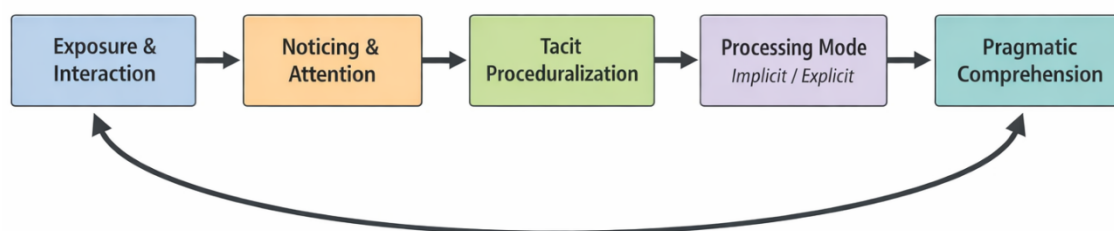


Figure 2. Tacit Pragmatic Processing Flowchart

Figure 2 presents a conceptual model illustrating how tacit knowledge may contribute to pragmatic processing in EFL learners. The model shows a sequence of interconnected stages that explain how pragmatic comprehension can develop through communicative experience. The process begins with Exposure and Interaction, which represent learners' engagement with authentic language use in social communication. Through repeated interaction with speakers and communicative contexts, learners receive input that contains pragmatic cues such as politeness markers, indirect expressions, and contextual meanings.

The next stage is Noticing and Attention, where learners consciously or subconsciously attend to certain language features in the input. According to the noticing hypothesis (Schmidt, 1993), attention plays an important role in transforming language input into internalized knowledge. After this stage, repeated exposure and noticing gradually lead to Tacit Proceduralization. In this stage, pragmatic patterns become internalized as tacit knowledge through experience and practice. This knowledge is not always consciously accessible but can guide language use automatically.

The model then shows Processing Mode, which may involve either implicit or explicit processing. In familiar communicative contexts, tacit knowledge supports implicit and automatic interpretation of pragmatic meaning. In unfamiliar situations, learners may rely more on explicit reasoning and rule-based processing. These processes ultimately lead to Pragmatic Comprehension, where learners interpret the intended meaning of utterances based on context, social norms, and communicative intention.

Finally, the model includes a feedback loop from pragmatic comprehension back to exposure and interaction. Successful communication creates new experiences that further reinforce tacit knowledge, allowing pragmatic competence to develop continuously over time. Overall, the model suggests that pragmatic competence is not developed solely through explicit instruction, but also through repeated exposure, attention to contextual cues, and the gradual formation of tacit knowledge.

Limitations and Future Direction

As a theoretical article, the discussion here is based mainly on literature synthesis rather than new experimental data. Future research may include empirical testing using reaction-time experiments, classroom observation, or longitudinal studies to examine how tacit pragmatic knowledge develops over time.

Further research may also explore cultural factors influencing tacit knowledge in communication, especially in multilingual contexts such as Indonesia. Cultural norms strongly shape pragmatic interpretation, and understanding these influences may improve language teaching practice.

CONCLUSION

Based on the literature reviewed, which includes theories of tacit knowledge, psycholinguistic studies on implicit and explicit processing, and research in interlanguage pragmatics, it can be concluded that pragmatic competence in EFL learning is not only influenced by explicit knowledge of language rules. The ability to understand implied meaning, indirect speech, and contextual nuances often depends on tacit knowledge that develops through exposure, interaction, and communicative experience.

From a psycholinguistic perspective, pragmatic comprehension involves both automatic and controlled cognitive processes. Automatic processing, supported by tacit knowledge, helps learners interpret meaning quickly and naturally, especially in familiar contexts. Meanwhile, explicit knowledge tends to support understanding when learners face unclear or unfamiliar situations. Therefore, pragmatic competence cannot rely only on formal instruction but also requires meaningful communicative experience.

This finding suggests that English language teaching should not focus only on grammar explanation and explicit rules. Teachers need to provide contextual communication practice, authentic interaction, and reflective activities so that tacit pragmatic knowledge can gradually develop. Learning environments that encourage interaction and repeated exposure to real language use are very important for improving pragmatic competence.

However, this article is based on a literature review, so the conclusions remain theoretical rather than empirical. Future research should conduct experimental or classroom-based studies to examine how tacit knowledge works in real-time pragmatic processing among EFL learners. Such research will help strengthen both theoretical understanding and practical teaching strategies.

In summary, developing pragmatic competence requires not only explicit instruction but also continuous communicative exposure that supports the growth of tacit knowledge. This balance is essential for helping EFL learners use English appropriately and effectively in real communication.

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PHONOLOGICAL ERROR ANALYSIS OF EFL STUDENTS' PRONUNCIATION IN ENGLISH SONGS USING SPEECH-TO-TEXT TECHNOLOGY TOOLS

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ABSTRACT

This research is motivated by the importance of mastering phonology in learning English as a foreign language, especially in the aspect of pronunciation which is still a challenge for students. This study aims to identify the types of phonological errors that appear in students' singing, determine the most dominant categories of errors, as well as uncover the factors that affect their pronunciation difficulties. The research uses a qualitative descriptive approach with an error analysis method. Data was obtained from the singing recordings of 19 students of the English Education Study Program which were then transcribed using several automatic transcription software and verified through phonetic analysis based on the International Phonetic Alphabet. The results showed that of the 19 identified deviations, there were 12 cases that could be categorized as representative phonological errors. These errors include consonant errors, vowel errors, sound omissions, sound additions, metathesis, epenthesis, and nasal errors. The most dominant categories of errors are consonant errors and vowel errors, which each account for 25% of the overall data. The findings also show that students' pronunciation difficulties are influenced by first language interference, limitations of phonological awareness, difficulty processing interconnected speech, and the influence of auditory imitation when singing English songs. This study concludes that phonological analysis combined with automatic transcription technology is able to provide a more objective picture of students' pronunciation error patterns and can be used as a basis for the development of more effective pronunciation learning.

Keywords: phonological errors, English pronunciation, EFL students, automatic transcription, phonetic analysis

INTRODUCTION

Learning English as a Foreign Language (EFL) today requires a mastery of communicative phonology. Phonological competence includes the ability to accurately produce segmental and suprasegmental features to achieve intelligible speech in global interactions. Fundamentally, learning a second language is not a linear or simple process, but rather a long and complex endeavor involving cognitive, affective, and social dimensions. Brown (2007, p. 15) has emphasized that language learning is not just a mastery of mechanical steps, but an effort that requires the total involvement of all aspects of the learner's self in order to be able to communicate spontaneously and meaningfully.

In the microlinguistic spectrum, Roach (2009, p. 31) explains that phonemes are the basic units that distinguish meaning, so an accurate understanding of phoneme systems and their transcription is a crucial foundation. However, for EFL learners, challenges often arise due to inaccuracies in articulation. (Koshy Joseph, 2023) has affirmed that effective communication depends not only on vocabulary and grammar, but also on pronunciation accuracy. Common mistakes, such as vocal distortion, pronunciation of silent letters, as well as stress and intonation patterns, are often obstacles that lower student confidence. This problem is in line with the findings of Salim (2025, p. 2), which shows that students often face difficulties in distinguishing certain consonant sounds, especially in words that contain silent consonant sounds. Furthermore, Gerosa et al. (2009, p. 1) noted that acoustic variability due to differences in vocal tract anatomy and imperfect articulator control is often a technical obstacle in learners' speech recognition.

Gaps in attention to phonological aspects risk hindering the effectiveness of long-term communication. Kelly (2000, p. 13) highlights a paradox in which phonology teaching is often neglected or is only done reactively. To achieve comprehensive mastery, phonology features

must be strategically integrated into learning planning so that they are not just complementary activities (Kelly, 2000, p. 14). At Swadhipa Natar High School, the low mastery of phonology is exacerbated by the reliance on less attractive textbook media, which contributes to the low achievement of students' speaking scores—with 61.08% of students not achieving the minimum completeness criteria (Salim, 2025, p. 4).

To overcome these challenges, the integration of Automatic Speech Recognition (ASR) technology offers an objective diagnostic solution. ASR is the process of converting acoustic signals captured through a microphone into a set of words that can be interpreted textually (Das et al., 2015, p. 191). This system operates through several crucial stages, ranging from acoustic signal processing, feature extraction using Mel Frequency Cepstral Coefficients (MFCC), to modeling using the Hidden Markov Model (HMM) to map sounds into word units (Das et al., 2015, p. 194). The main advantage of this technology-based approach is its ability to map phonological deviations consistently, which is very useful for educators to provide measurable feedback (Das et al., 2015, p. 192).

The integration of this technology is strengthened by the use of English songs as a learning medium. Shen (2009, p. 89) states that songs create a relaxed learning environment and activate both hemispheres of the brain. Songs provide rich exposure to connected speech, as well as lower students' affective filters. Misa (2024, p. 151) confirms that this technique is effective in improving pronunciation skills and learning motivation. This superiority is also attested by Salim (2025, p. 3), who found that songs function as a medium that trains students' hearing and articulation in a fun way due to the natural repetition of lyrics.

Although the use of songs in learning English pronunciation has been extensively researched, most previous research has focused on improving pronunciation skills, learning motivation, or the effectiveness of songs as a learning medium. Research that specifically identifies the types of phonological errors of EFL learners through the integration of speech-to-text technology and phonetic analysis based on the International Phonetic Alphabet (IPA) is still relatively limited. Therefore, this study seeks to fill this gap by presenting a more objective and measurable diagnostic approach. The novelty of this research lies in three main aspects. First, this study utilizes several automated transcription tools, namely TurboScribe AI, Instant Transcription, and Audio-to-Text Transcription, to obtain more comprehensive error identification results. Second, this study combines speech-to-text technology with IPA-based phonetic analysis so that pronunciation errors are not only detected automatically, but can also be verified linguistically. Third, this study uses English songs as an analytical context, thus allowing the observation of sound production in a more authentic situation and close to language learning practices.

This research aims to explore students' phonological errors through the integration of automatic transcription technology and analysis based on the International Phonetic Alphabet (IPA). The focus of the main problem is how speech-to-text technology can objectively map phonological deviations when students sing English songs, with a special emphasis on the silent consonant patterns that are often an obstacle for learners (Salim, 2025, p. 5). The use of optimized ASR technology has been proven to improve diagnostic precision in detecting pronunciation deviations compared to generically designed systems (Das et al., 2015, p. 192).

Based on this background, this research is directed to answer three main questions, namely: (1) what are the types of phonological errors that appear in student singing; (2) which phonological errors are the most dominant; and (3) what factors are behind the difficulties. This research is expected to make a methodological contribution for educators in accurately mapping phonological errors, as well as a guide for the development of more measurable song-based teaching materials.

METHODS

This study uses a qualitative descriptive approach, where according to Moleong (2005, p. 48), this approach is a research procedure that produces descriptive data in the form of written or spoken words from people and observed behaviors to understand the phenomenon in depth. In line with this, this study applies the Error Analysis method to classify the types of language errors that occur in the language production process by learners (Al-Sowaidi, 2022).

Participants in this study were 19 students in the fourth semester of the English Education Study Program of UIN North Sumatra who were chosen because they were assumed to have taken the Phonology or Pronunciation course. The primary data sources of the study consisted of audio recordings of English song singing produced by students as well as the original lyrics of songs used as a comparative reference in the process of identifying phonological errors.

The data collection technique is carried out through the documentation method by asking students to record English songs independently and then analyze. In this study, the researcher acted as the main instrument (human instrument) supported by several speech-to-text software, namely TurboScribe AI, Instant Transcription, and Transkriptor. The use of more than one software aims to improve the validity of the data through triangulation of transcription results so that error identification does not depend solely on a single speech recognition system. In addition, the use of multiple tools allows researchers to compare the transcription results produced by each system to obtain a more comprehensive picture of phonological errors.

The data analysis technique follows the interactive analysis model of Miles and Huberman (1992, p. 15) which includes data collection, data reduction, data presentation, and conclusion drawn. The research procedure began with the collection of audio recordings of student songs. Furthermore, the recordings are processed using TurboScribe AI, Instant Transcription, and **Transkriptor** to generate automatic transcriptions. The transcription results are then compared with the original lyrics of the song to identify words that have deviations or inconsistencies. The next stage is an initial screening using software to detect possible pronunciation errors (Al-Sowaidi, 2022), which is then followed by manual verification through rehearing of the recording to ensure data accuracy. After that, the errors found are transcribed into the International Phonetic Alphabet (IPA) to analyze the form of phonological deviation in more detail. In the final stage, errors are classified by their type, analyzed to find dominant patterns, and interpreted to identify the factors behind the occurrence of the error. Through this stage, the research seeks to distinguish between systematic errors and unintentional errors (Al-Sowaidi, 2022), so that a more accurate picture is obtained of the characteristics of students' phonological errors in singing English songs.

RESULTS AND DISCUSSION

Overview of Identified Errors

Tabel 1. Phonological Errors Identified from Students' English Song Performances

Subject	Song Title	Error Output	Target Form	IPA Diagnosis
1	<i>Blank Space</i>	"Where you been"	"Where have you"	Omission: Deletion of auxiliary /həv/.

2	<i>10,000 Hours</i>	"Grow up born"	"Grow up on "	Consonant Addition: Intrusive bilabial plosive /b/.
3	<i>Blue</i>	"Wait you by"	"Watch you go by"	Phonemic Substitution: /wɒtʃ/ replaced by /weɪt/.
4	<i>Payphone (versi no rep)</i>	"Bridges burned down"	"Bridges burn "	Morpho-phonemic Error: Overgeneralization of /-ed/ suffix.
5	<i>Perfect</i>	"Paid in what I see"	" Faith in what I see"	Devoicing: Labiodental fricative /f/ replaced by plosive /p/.
6	<i>Simple Plan Perfect</i>	"I love No"	"I know "	Phonetic Interference: Confusion between /noʊ/ and /lʌv/.
7	<i>Just a Friend to you</i>	"Very captured"	" Burying "	Labiodental Confusion: /b/ (bilabial) replaced by /v/.
8	<i>I'd Risk It All for You</i>	"Wind thing"	" One thing"	Vowel Shift: /ʌ/ (central) shifted to /ɪ/ (front).
9	<i>A Thousand Years</i>	"Time has broke"	"Time has brought "	Monophthongization: Diphthong /oʊ/ used for long vowel /ɔ:/.
10	<i>Can't Take My Eyes Off You</i>	"Blood on the way"	" Love in the way"	Cluster Error: Poor articulation of /lʌv ɪn/ sequence.
11	<i>The One That Got Away</i>	"RICO soon"	" Read you soon"	Assimilation Error: Slurred /d/ + /j/ sounds.
12	<i>The One That Got Away</i>	"1 day, go away"	"One that got away"	Syllable Deletion: Removal of functional segments.

13	<i>The Wheels on the Bus</i>	"All the 2, the town"	"All through the town"	Dental Fricative Error: /θ/ replaced by plosive /t/.
14	<i>That somebody</i>	"Expect someone"	" Except someone"	Metathesis: Transposition of /p/ and /s/ sounds.
15	<i>Remember Me</i>	"Though I have to"	"Though"	Epenthesis: Unnecessary sound/word addition.
16	<i>You'll Be in My Heart</i>	"Mean my heart"	" In my heart"	Nasal Nasalization: Alveolar /n/ shifted to bilabial /m/.
17	<i>Shape of My Heart</i>	"Put out the globe"	"Put out the glow "	Final Consonant Addition: Intrusive /b/ at word-end.
18	<i>Twinkle Twinkle Little Star</i>	"Above world"	"Above the world"	Article Omission: Deletion of the determiner /ðə/.
19	<i>Ours to Keep</i>	"Son of the day"	" Sun of the day"	Vowel Merger: Confusion between /ʌ/ and /ʊ/.

(Source: EFL Student Voice)

Table 1 presents all the phonological aberrations identified in the recording. However, not every deviation is chosen to be discussed in detail. Following the principle of qualitative error analysis, only representative cases that clearly show the phonological process are selected for in-depth analysis. Some cases are excluded from detailed discussion because they may reflect lexical substitution, semantic reinterpretation, or possible inaccuracies generated by speech-to-text converter applications, rather than actual phonological errors. Therefore, the next discussion focuses on the most linguistically representative examples to ensure analytical accuracy and theoretical consistency (Ellis & Barkhuizen, 2005, p. 57).

B. Representative Phonological Errors

Of the total 19 error data found in Table 1, only 12 were selected as representative data for further phonological analysis. This selection was made because not all errors that appear can be categorized as pure phonological errors. Some data involve changes in grammatical structure, omissions of functional words, or possible results of hearing errors that are not directly related to the production of language sounds. Therefore, this study focuses on data that show real sound changes, such as consonant substitution, vowel changes, sound addition, sound removal, metathesis, and epenthesis. These categories correspond to the phonological processes commonly discussed in segmental phonology studies (Odden, 2013, pp. 131–145).

Tabel 2. Pure Phonological Errors

Subject	Song Title	Error Output	Target Form	IPA Diagnosis
2	<i>10,000 Hours</i>	"Grow up born"	"Grow up on"	Consonant Addition: Intrusive bilabial plosive /b/.
5	<i>Perfect</i>	"Paid in what I see"	" Faith in what I see"	Devoicing: Labiodental fricative /f/ replaced by plosive /p/.
8	<i>I'd Risk It All for You</i>	"Wind thing"	" One thing"	Vowel Shift: /ʌ/ (central) shifted to /ɪ/ (front).
9	<i>A Thousand Years</i>	"Time has broke"	"Time has brought "	Monophthongization: Diphthong /oʊ/ used for long vowel /ɔ:/.
13	<i>The Wheels on the Bus</i>	"All the 2, the town"	"All through the town"	Dental Fricative Error: /θ/ replaced by plosive /t/.
14	<i>That somebody</i>	"Expect someone"	" Except someone"	Metathesis: Transposition of /p/ and /s/ sounds.
16	<i>You'll Be in My Heart</i>	"Mean my heart"	" In my heart"	Nasal Nasalization: Alveolar /n/ shifted to bilabial /m/.
17	<i>Shape of My Heart</i>	"Put out the globe"	"Put out the glow "	Final Consonant Addition: Intrusive /b/ at word-end.
19	<i>Ours to Keep</i>	"Son of the day"	" Sun of the day"	Vowel Merger: Confusion between /ʌ/ and /ɒ/.

Total = 9 cases

Tabel 3. Borderline Phonological Errors

Subject	Song Title	Error Output	Target Form	IPA Diagnosis
1	<i>Blank Space</i>	"Where you been"	"Where have you"	Omission: Deletion of auxiliary /həv/.
15	<i>Remember Me</i>	"Though I have to"	"Though"	Epenthesis: Unnecessary sound/word addition.
18	<i>Twinkle Twinkle Little Star</i>	"Above world"	"Above the world"	Article Omission: Deletion of the determiner /ðə/.

Total = 3 cases

Types of Phonological Errors That Appear in Student Singing

Based on the analysis of 12 representative data in Table 2, seven types of phonological errors were found that appeared in student singing, namely consonant errors, vowel errors, omissions, additions, metathesis, epenthesis, and nasal errors.

Consonant Errors

Consonant errors are one of the most common types of errors found in data. These errors include substitutions, additions, or changes to certain consonant characteristics.

For example, in faith data pronounced paid, the voiceless labiodental fricative phoneme /f/ is replaced by the voiceless bilabial explosive phoneme /p/. This error indicates a process of consonant substitution that is common in English learners as a foreign language when the target sound is considered difficult to produce (Avery & Ehrlich, 1992, p. 15).

Another example is found in the pronunciation of *through* to *two*, where the dental fricative phoneme /θ/ is replaced by the alveolar explosive phoneme /t/. The /θ/ sound is not present in the Indonesian phonological system so it is often replaced by the sound that is considered closest by Indonesian speakers (Odlin, 1989, p. 27).

In addition, there were also cases of adding consonants to the phrase *grow up on* which were pronounced to *grow up born* and *glow* which was pronounced as *globe*. In both cases, the phoneme /b/ appears that is not present in the target form.

Vowel Errors

The next type of error is vowel error which includes vowel shift, vowel fusion, and monophthongization. In the data of *one thing* pronounced as *wind thing*, the vowel /ʌ/ shifts to /ɪ/. This phenomenon indicates a vowel shift, which is a change in the position of the vocal articulation from the central position to the front position.

Meanwhile, in the data of *sun* pronounced as *son*, there is a vowel merger between the vowels /ʌ/ and /ɒ/. This mistake shows that students have difficulty distinguishing two English vowels that do not have a clear equivalent in Indonesian.

Another case was found in the word *brought* which is pronounced broke. In this data, there is a simplification of diphthongs to monophthongization, which is when complex vowel circuits are replaced with single vowels that are easier to produce (Odden, 2013, p. 143).

Omission

Omission is the omission of sounds or speech elements that should appear in the form of a target. In this study, omissions were found in the data *where have you* which was pronounced as *where you* and *above the world* which was pronounced as *above world*.

According to Yule (2020, p. 43), the omission of speech elements often occurs when the speaker processes speech so quickly that some phonological elements are not perceived in their entirety.

Addition

Addition occurs when the speaker adds a sound that is not present in the target shape. An example is found in the phrase *grow up on* which is pronounced to *grow up born*. The addition of the phoneme /b/ results in a new form that is different from the original target.

According to Fromkin, Rodman, and Hyams (2018, p. 287), the process of adding sounds can appear as an attempt by the speaker to adjust sound patterns that are considered easier or more familiar.

Metathesis

Metathesis is the exchange of positions of two sounds in a word. In the except data that is pronounced as *expect*, there is a shift in the position of the /s/ and /p/ sounds.

Metathesis is one of the phonological processes that occurs when the speaker has difficulty maintaining the correct phoneme sequence (Odden, 2013, p. 141).

Epenthesis

Epenthesis is the addition of sounds or elements of speech to a form that doesn't actually need it. In the *though* data that is pronounced as *though I have to*, students add phonological elements that are not found in the original lyrics.

According to Carr (2019, p. 115), epenthesis often appears as a strategy to facilitate speech production or maintain rhythm in speech.

Nasal Error

Nasal errors are found in the pronunciation *in my heart* to mean *my heart*. In this case, the nasal alveolar phoneme /n/ changes to the nasal bilabial phoneme /m/.

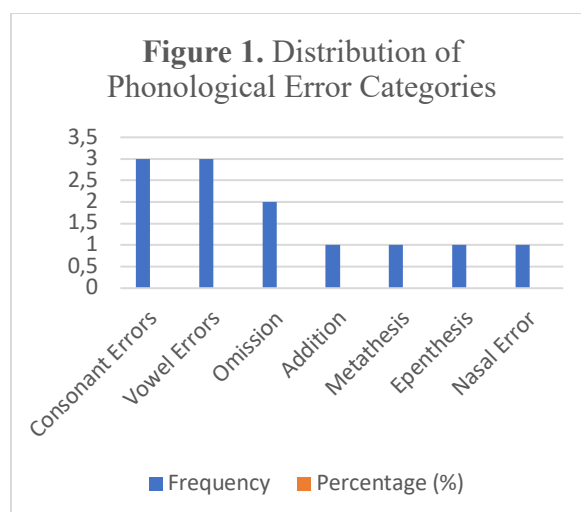
These changes indicate the assimilation of the articulation site which causes the nasal sound to move to a different articulatory position (Roach, 2009, p. 47).

Based on these findings, it can be concluded that phonological errors that appear in student singing include various segmental processes, both involving consonants and vocals. This variation of error suggests that students still face difficulties in producing sounds in English that are different from their first language phonological system.

Dominant Error Categories

Table 4. Frequency of Phonological Error Categories

Error Type	Frequency	Percentage (%)
Consonant Errors	3	25.0
Vowel Errors	3	25.0
Omission	2	16.67
Addition	1	8.33
Metathesis	1	8.33
Epenthesis	1	8.33
Nasal Error	1	8.33
Total	12	100



Based on Table 4 and Figure 1, the two most dominant categories of errors are consonant errors and vowel errors. Each category appeared three times or 25% of the total 12 cases analyzed.

The dominance of consonant errors can be seen in the case of replacing the /f/ sound with /p/, replacing /θ/ with /t/, and adding the phoneme /b/ in some words. These findings show that students have difficulty in producing English consonant sounds that are not found in the Indonesian phonology system. According to Avery and Ehrlich (1992, p. 15), second language learners tend to replace unfamiliar sounds with sounds that are closest to their first language.

Vowel errors also appear with the same frequency. These errors include vowel shift, vowel fusion, and monophthongization. The findings show that students still have difficulty in distinguishing the quality of English vowels, which are relatively more complex than the Indonesian vowel system. Roach (2009, p. 24) explained that English has much more vowel variations than many other languages so it often causes mistakes in foreign language learners.

Meanwhile, the omission category ranks next with a frequency of two cases or 16.67%. The addition, metathesis, epenthesis, and nasal error were only found once or 8.33% each.

Overall, the results showed that errors at the segmental level, particularly consonants and vowels, were the most dominant types of errors in student singing. These findings indicate that the production of English phonemes is still a major challenge for EFL students, especially when they have to imitate the pronunciation of English songs.

CONCLUSION

Based on the results of an analysis of 19 recordings of EFL students' singing using automatic transcription technology and IPA-based phonetic verification, this study found that not all detected irregularities can be categorized as pure phonological errors. After the selection and verification process, 12 cases were obtained that were considered representative to be further analyzed as phonological errors.

The results of the study showed that the phonological errors that appeared included seven main categories, namely **consonant errors, vowel errors, omissions, additions, metathesis, epenthesis, and nasal errors**. These errors reflect the difficulty students have in producing English sounds that differ from the Indonesian phonological system, especially in phonemes that do not have a direct equivalent in their first language.

Based on the frequency of occurrence, **consonant errors and vowel errors were the most dominant categories**, each with three cases (25%). Consonant errors are characterized by the substitution of sounds such as /f/ to /p/ and /θ/ to /t/, as well as the addition of certain consonants. Meanwhile, vowel errors appear in the form of vowel shift, vowel fusion, and

monophthongization. These findings suggest that segmental phoneme production is still a major challenge for EFL students when singing English songs.

In addition, this study found that students' pronunciation difficulties are influenced by several main factors, namely **L1 interference, limited phonological awareness, difficulties in processing connected speech, and the influence of auditory imitation when listening to songs**. Among these factors, first language interference appears to be the most dominant factor as most of the errors found are related to sound substitution that is not present in the Indonesian phonological system.

Methodologically, this study also shows that the integration of **Automatic Speech Recognition (ASR)** technology with phonetic analysis based **on the International Phonetic Alphabet (IPA)** can be an effective approach to identify and map students' phonological errors more objectively and systematically. Therefore, this approach has the potential to be used as a diagnostic tool in pronunciation learning to help lecturers and students understand areas of pronunciation difficulties more accurately and design learning strategies that are more targeted.

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DEVELOPING BASIC ENGLISH COURSEBOOK LEVEL 2 FOR UNIVERSITY STUDENTS AT STKIP AGAMA HINDU SINGARAJA

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ABSTRACT

This research aimed to develop a Basic English Coursebook Level 2 for first-semester students of the English Language Education Study Program at STKIP Agama Hindu Singaraja. The background of this research was the absence of a standardized main coursebook and inconsistency in instructional materials across semesters, which resulted in a gap between the materials delivered and the actual learning needs of the students. This research employed Design and Development Research (DDR) using the ADDIE model, which consisted of analysis, design, development, implementation, and evaluation stages. The data were collected through interviews, observations, and expert validation. The findings showed that the developed coursebook consists of 35 units integrating the four language skills (listening, speaking, reading, and writing) along with grammar and vocabulary, aligned with CEFR level A2, and meaningful engagement. Based on the validation results from two expert judges, the product obtained an overall average score of 85.7%, which categorizes the coursebook as "Very Feasible" to be used as a primary teaching material. Furthermore, the coursebook was considered effective to be used in English language learning. Therefore, this developed coursebook was expected to serve as a solution to enhance the quality of basic English teaching in higher education at STKIP Agama Hindu Singaraja.

Keywords: English Coursebook, Needs Analysis, Material Development

INTRODUCTION

Language is used to create a meaningful communication among human beings. In Indonesia, English is a foreign language that plays a strategic role as a medium of global communication in various fields, such as education, science, technology, business, and international relations. As the Lingua Franca of education, business, science, and technology (Crystal, 2003). Various studies have shown that English language learning in universities needs to be oriented towards developing communicative competence, critical thinking skills, and language use in academic and professional contexts (Rubio, 2025; Mihret & Joshi, 2024).

In higher education, English language learning no longer focuses solely on grammar mastery but is directed towards students' ability to use English effectively in a variety of academic and professional situations. Students are required to develop four language skills, such as: listening, speaking, reading, and writing in an integrated manner.

The success of English language learning is influenced by various components, one of which is the quality of materials. Teaching materials are a crucial element that guides lecturers in implementing learning and serve as the primary learning resource for students. Good teaching materials must be systematically structured, aligned with learning outcomes, consider student characteristics, and facilitate the gradual development of language competency. The availability and quality of learning resources significantly influence the success of language instruction (Richards, 2001).

In English language learning, textbooks/coursebook are materials that serve a crucial function. Textbooks not only contain learning materials but also provide a systematic sequence of material presentation, learning activities, exercises, evaluations, and learning guides. Vitta (2021) explains that textbooks remain the primary source for most English Language Teaching (ELT) materials in various countries because they provide a clear learning structure and support lecturers in implementing the learning process effectively.

In the context of English as a Foreign Language (EFL), learners often do not have daily exposure to English outside the classroom, making formal instruction and structured learning

environments crucial (Harmer, 2007). English learning was often motivated by academic, occupational, or personal needs, and success depends on the learner's exposure, motivation, cognitive development, and instructional methods used.

Moreover, English language learning comprises various interrelated components that collectively develop a learner's communicative competence. They are: four macro skills (listening, speaking, reading and writing), and language aspects (grammar and vocabulary). These components were often categorized as language skills, subskills, and language systems (Harmer, 2007).

In English language learning, students need all materials, tools, and supports used to facilitate English language instruction and learning. These include coursebooks, audio-visual materials, digital platforms, applications, dictionaries, graded readers, and teacher-made materials. The availability and quality of learning resources significantly influence the success of language instruction (Richards, 2001). Moreover, Tomlinson (2011) stated that effective learning materials should be engaging, relevant, meaningful, and conducive to learner autonomy. Textbooks, for example, were still widely used as a core resource due to their structured content, alignment with curriculum standards, and comprehensive skill coverage.

However, initial observations at Study Program of English Language Education at STKIP Agama Hindu Singaraja indicated that various obstacles remain in the provision of materials. One of the main contributing factors was the absence of a standardized set of learning materials that served as a core reference during the learning process. There was no consistency in the materials used by different lecturers, resulting in students lacking a clear understanding of the competencies they were expected to acquire in each semester.

Ideally, first-semester students should have had a solid understanding of Basic English materials such as tenses, appropriate to their proficiency level. However, in reality, many first-semester students still struggled with these fundamental grammar concepts. This mismatch reflected a gap between the materials delivered and the actual learning needs of the students.

Based on the needs analysis conducted, it was discovered that the learning process lacks textbooks specifically designed to meet the learning objectives of the course and student characteristics. Lecturers have been utilizing various separate learning resources, such as simple modules, presentation materials, internet articles, and various reference books. This situation results in a lack of systematic learning for students.

This research focused on the development of an English coursebook for students in the English Language Education Study Program at STKIP Agama Hindu Singaraja. The results describes the steps of designing and developing the Basic English Coursebook Level 2 for University Students and described the quality of the Basic English Coursebook Level 2 for University Students at STKIP Agama Hindu Singaraja..

In English Language Teaching (ELT), coursebooks continue to serve as one of the primary instructional tools that structure and support both teaching and learning processes. Tomlinson (2018), a leading figure in materials development, emphasizes that a high-quality English coursebook should not only focus on the presentation of language items, but also promote meaningful, engaging, and sustainable language learning.

Tomlinson (2011) have proposed several principles for developing effective language teaching materials:

1. Materials should provide exposure to authentic language in use.
2. Materials should help learners develop confidence.
3. Materials should be perceived as relevant and useful
4. Materials should stimulate intellectual, aesthetic, and emotional involvement.
5. Materials should provide opportunities to use the target language.

Hutchinson and Waters (1987) argue that materials development should be a learning-centered process rather than a language-centered one. They emphasize that effective materials

should consider both target needs (what learners need to learn) and learning needs (how learners prefer to learn).

RESEARCH METHODS

This study used a Design and Development Research (DDR). It focused on specific instructional materials other research has a broader concern and addresses the development of the entire program (Richey and Klein, 2007: p.51). The study was conducted at STKIP Agama Hindu Singaraja in Singaraja – Bali, offered English-medium instruction programs for students at study program of English Language Education. The participants were: first semester English language education student of STKIP Agama Hindu Singaraja, an English Lecturers who taught Basic English and two expert judges who were competent in the fields of English Language Teaching and instructional material development, responsible for evaluating and validating the developed coursebook.

There were 5 steps conducted in this research for supporting Design and Development Research (DDR) methods, such as: analyze needs, design solutions, develop learning products, implement them in real settings, and evaluate their effectiveness as called as the ADDIE model.

Data collection in this study was conducted in several stages to obtain comprehensive and valid data. In-depth interviews were conducted with two English lecturers and a first-semester of STKIP's student. The interviews explored participants' perspectives on the developed coursebook, its practicality in classroom implementation, and suggestions for refinement. Classroom observations were carried out during the pilot implementation phase to monitor the usability and practicality of the coursebook in real teaching situations.

An observation checklist was used to record aspects such as students' engagement, the interaction between students and lecturers, and the integration of communicative learning activities. Last, the draft coursebook was evaluated by two experts in English Language Teaching and instructional material development using a structured validation rubric. This process aims to ensure that the coursebook meet academic standards, addressed students' needs, and followed the principles of the ADDIE model.

Data analysis followed a convergent mixed-methods design (Creswell & Plano Clark, 2018):

- 1) Quantitative data (expert validation ratings) were analyzed using descriptive statistics such as percentages and mean scores to summarize the experts' evaluations. These calculations were used to determine the feasibility category of the developed coursebook and to identify its strengths and weaknesses based on the expert judges' assessments.
- 2) Qualitative data (interviews, observations) were analyzed through thematic analysis (Braun & Clarke, 2006) to identify patterns and participant perspectives.
- 3) Triangulation was applied to increase validity, ensuring alignment between learner needs, expert feedback, and practical application.

The research was considered successful if the product was proved suitable to be used. It means that this study was considered a successful study if both experts' judgment considered the coursebook a qualified product for students in the English Language Education Study Program.

FINDINGS AND DISCUSSION

This research aimed to develop a Basic English Coursebook Level 2 for students at STKIP Agama Hindu Singaraja. This coursebook was designed to help students in learning the basic English regarding to the knowledge, skills and contents.

First step was Needs Analysis Stage. The analysis stage was the initial stage conducted before developing the coursebook. This stage aimed to identify learning needs related to the development of the Basic English Coursebook Level 2. Based on initial observations, it was

found a coursebook used in the learning process was not yet available, and the materials, including the practice exercises, were not sufficiently varied. Students generally relied only on materials presented during lectures and limited learning resources, which resulted in a less optimal learning process and limited their ability to understand the material in depth. It made students still experienced difficulties in understanding some basic English materials, such as grammar, vocabulary mastery, and writing and speaking skills.

Furthermore, the coursebook used in the learning process was still limited and was not fully tailored to students' needs. Through brief interviews with lecturers, it was revealed that Basic English courses utilized materials obtained from various sources, with lecturers providing related exercises. It was also found that students at the beginning of the course had varying levels of English proficiency. Some students still experienced difficulties in understanding basic English materials such as vocabulary, grammar, and writing, reading, and speaking skills.

Second step was Designing Stage. The design stage was the phase of designing the structure and appearance of the Basic English Coursebook to be developed. At this stage, the researchers developed a draft of the materials, learning strategies, and visual design tailored to students' needs based on the results of the previous analysis. This design aimed to produce a coursebook that was systematic, engaging, and easy to understand, thereby supporting the English learning process more effectively. This design was carried out to create a coursebook that was not only informative but also capable of increasing students' motivation and interest in learning. The design was formulated by considering readability, visual appeal, and suitability to student characteristics.

During the design process, the researchers used the Canva Pro application to create the layout and visual design of the coursebook. Fonts such as Roboto were selected to provide a clear and easy to read display. Furthermore, the use of colors, images, and illustrations was adjusted to support material comprehension and increase student engagement in the learning process.

The coursebook materials were structured based on the learning outcomes of the Basic English course and were aligned with the results of the needs analysis. Each unit in the coursebook was systematically organized, covering four language skills (speaking, reading, writing, and listening), and was supplemented with relevant grammar and vocabulary materials. Furthermore, each unit was complemented with deep learning-based activities, such as critical thinking exercises, discussions, reflections, and contextual assignments, which were intended to encourage student engagement.

The Basic English Coursebook cover served as an initial identification before entering the main content. The cover was designed to include information about the book title, institution, and target audience. The visual design was composed by considering colour combinations, typography, and relevant illustrations to convey a professional and academic impression. The content of the Basic English Coursebook was designed based on the principles of clarity, readability, and visual appeal as stated by Tomlinson (2013) and Meyer (2021) about Principles of Learning Materials. The Roboto font was chosen for its high readability, with proportional spacing. Furthermore, the materials were supplemented with examples, exercises, and contextual learning activities to enhance student engagement and understanding.

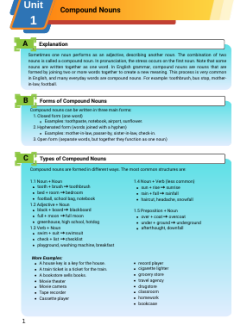
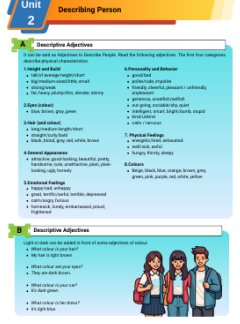
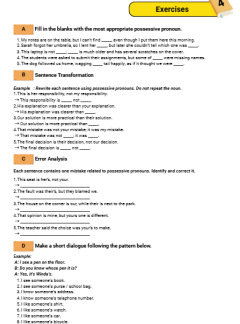
Related to material design and development, there were materials developed in this book according to the syllabus, they were: 1) Compound Nouns, 2) Describing Person, 3) Describing Things, 4) Possessive and Reflexive Pronouns, 5) Simple Present Tense, 6) Present Continuous Tense, 7) Question Word: Which, 8) The Use of Modal Auxiliary "Should", 9) Simple Past Tense, 10) Irregular Verbs, 11) Expressions of Quantity, 12) Expressions of Quantity, 13) Prepositions, 14) Could and Would, 15) Present Perfect Tense, 17) May and Might, 18) Past Participle, 19) Passive Voice, 20) Frequency Expressions, 21) The use of

“There is” and “There are”, 22) Future Time, 23) Have Got, 24) Relative Clauses, 26) Noun Modifiers, 27) Time Expressions, 28) Expressions of Aches and Pains, 29) Adverbs and Expressions of Manner, 30) Word Order in Sentences.

Fourth step was Development Stage. The development phase was a continuation of the design phase, aiming to translate the design into a tangible product. This phase involved compiling materials, developing visual designs, and integrating all learning components into the coursebook. The development process involved compiling learning materials based on the blueprint developed in the previous phase. The materials were structured according to the learning outcomes of the Basic English course and were tailored to students’ needs.

Each unit in the coursebook was systematically developed, containing core materials, exercises, and learning activities covering the four language skills: listening, speaking, reading, and writing. Relevant grammar and vocabulary materials were also included to support students’ understanding. The result of this development phase was the Basic English Coursebook Level 2, which consisted of several learning units. Each unit was complemented by learning materials, practice questions, and deep learning based activities such as discussions, critical thinking tasks, and reflections. Through this development phase, the Basic English Coursebook Level 2 was produced. It had gone through a process of design, evaluation, and refinement, making it suitable for use as a coursebook in English learning.

Table 1. Summary of Expert Judges Results Before the Revision

Cover Design	Content Design	Content Design	Exercise Design
 The cover design of the Basic English Book 2 features a vibrant blue and orange color scheme. It includes the title 'BASIC ENGLISH' in large, bold letters, with 'BOOK 2' below it. A 'Fun English' badge is prominently displayed. The background shows a smiling woman using a laptop, suggesting a modern, engaging learning environment.	 Unit 1: Compound Nouns. This page introduces the concept of compound nouns with a clear definition and examples. It lists various types of compound nouns and provides a list of words for students to identify and use. The layout is clean and organized, with a yellow header and a blue footer.	 Unit 2: Describing Person. This page focuses on adjectives used to describe people. It includes a list of adjectives and their meanings, along with a section for students to practice using these words in sentences. The design is consistent with Unit 1, featuring a yellow header and a blue footer.	 Exercises. This section contains various grammar and vocabulary exercises designed to reinforce the material from the previous units. It includes multiple-choice questions, fill-in-the-blanks, and short writing prompts. The exercises are clearly numbered and easy to follow.

In the implementation phase, the developed coursebook, namely the Basic English Coursebook Level 2, was implemented in the learning process. The implementation was carried out with students at STKIP Agama Hindu Singaraja who were taking the Basic English course. Since the limited time, the process of implementation could not be conducted for whole semester. It was only limited for several meetings. After the limited implementation process, data were collected through an interview to determine students’ responses to the use of the coursebook, including its content, layout, and ease of use.

The evaluation phase was the final stage in the ADDIE model, which aimed to assess the quality and feasibility of the developed Basic English Coursebook Level 2. The evaluation was conducted through a review process involving two expert judges who assessed the product using a structured validation rubric. Evaluation data were obtained through expert judges and a student response questionnaire administered after the implementation process. The questionnaire was used to identify the coursebook’s materials, presentation, and ease of use.

The two experts assessed the coursebook using a structured validation rubric consisting of 28 assessment items, which covered three aspects: Coursebook Features, Content Criteria, Inclusion and Suitability Criteria.

Table 1. Summary of Expert Judges Results Before the Revision

Judges	Total Score	Maximal Score	Percentage	Criteria
Expert Judge 1	112	140	80%	Feasible
Expert Judge 2	128	140	91,4%	Very Feasible
Average	120	140	85,7%	Very Feasible

The assessment results included comments and suggestions from the experts, which were used as references for improving the developed product. After the Basic English Level 2 coursebook was evaluated by expert judges, several revisions were required to enhance its quality and optimize its use in learning. Revisions were made based on comments and suggestions from the experts to improve the appropriate tenses of the content, presentation, and language aspects of the book.

CONCLUSION

Based on the result of needs analysis it was found that there was no standard coursebook to teach Basic English at STKIP Agama Hindu Singaraja. It made the Basic English Coursebook for Level 2 for students in the English Language Education Study Program at STKIP Agama Hindu Singaraja was developed. The quality of the coursebook was evaluated by two expert judges. They assessed three aspects: Coursebook Features, Content Criteria, and Inclusion and Suitability Criteria, with a maximum score of 140. The overall average score was 85.7%, which categorized "Very Feasible". There were several revisions already did after the evaluation by the expert.

Future researchers who were interested in developing a coursebook were encouraged to use this study result as a reference and to fix the existing limitations. It was suggested that future studies involve more participants and a wider scope of implementation to get more complete data about the effectiveness of the coursebook. Future researchers were also encouraged to develop coursebooks that cover higher levels of English proficiency, such as Basic English Level 3 or above, to support students' language development across semesters. In addition, it was suggested that future research explore the use of digital and interactive elements in coursebook design to meet the needs of today's technology-based learning.

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